Pests

AND THEIR CONTROL

1946

MAY

VOL. 14, NO. 5

ORGAN OF THE PEST CONTROL INDUSTRY

Exterminators
Fumigators
Termite Control Operators
Entomologists
Insecticide and Supply Mfgrs.

7

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COOPERATING WITH NATIONAL PEST CONTROL ASSOCIATION

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EDITORIAL

New Era of Competition for PCO's

IN THE YEARS AHEAD, PCO's will see and face a new era of competition in the field. It will be necessary to produce and sell a far greater volume of service than ever before. Already, since the close of the war, scores of servicemen who have had experience in some way or other in various branches of pest control work have entered the pest control business, and many more will enter as soon as they return from service. How many will remain in the business is something that we do not know: however, the fact remains that unless PCO's increase their knowledge and take advantage by bettering themselves in the technique of operations, by securing a thorough knowledge of chemicals and materials and new methods, it will be very difficult to keep abreast of the new competitive forces that are now appearing.

To get the full background of this new competitive corps of PCO's suddenly appearing in the field, it is only necessary to remind you of the ever-swelling propaganda publicizing DDT in daily newspapers, popular magazines, scientific journals covering entomology and medicine, and technical journals of chemical industry, that has brought about such tremendous interest among those who were directly or indirectly interested in pest control problems.

It is little wonder that such a phenomenal interest created in the minds of those who were partially interrested in the pest control work caused many to take advantage of the avalanche of publicity by entering the pest control service to "cash in", as they say. As an industry, excellent service must be rendered to the public if PCO's expect to obtain their share of business. Their service will have to be better than ever.

The scientific approach to the age-old problem of selling PCO service as well as the importance of our profession to the public, and to meet that ever-growing competitive force, calls for PCO's to keep abreast of the steady march of progress by increasing their knowledge of chemicals and materials, new methods and other vital, important factors, thus making of themselves reliable, dependable and genuine PCO's.

To keep up with the constant research development of our time, a new era in selling is beginning, an era when new conceptions of quality service are essential to success in highly competitive lines. Many progressive PCO's are determining now to give the highest possible quality of service to the public.

Be certain that you have that quality in your products and material—quality in your selling—quality in advertising your service, for it will pay you handsome dividends now and in the years to come.

Not a "Good Domestic Fumigation Practice"

THE FOLLOWING bit of advice appeared in an article, entitled "For Rodent Control . . . Why Not Fumigation?" in Food Materials and Equipment (March 1946): "Jobs involving up to 12 lbs. of the chemical [Larvacide] can be put in by one or two men without coming in contact with the fumes, and hence without need of mask."

Since a similar 'take-a-chance' attitude sums up the root cause of most of the Industry's worst fumigation accidents, the suggestion to forego masks, even under the conditions prescribed, is, we think, ill-advised.

At any rate we queried one of the country's outstanding fumigators on the subject. His reply, which minces no words, speaks for itself:

"A manufacturer of fumigants throws caution to the winds. The old cry of 'the hell with caution, let's sell our product,' rears its ugly head again and right in the midst of the biggest safety campaign in which this country has ever been engaged. There will always be suckers, so we suppose some will buy and try, which will not only affect the confidence of the public which has been established by the Pest Control Operator, but which will boomerang on the manufacturer of **all** fumigants.

"Why not stick to common sense, and cut out this nonsense? The Good Domestic Fumigation Practices were established by the industry that pays the bills and takes the rap when there are accidents. It's the industry that knows what is safe and not some fumigant manufacturer who is only interested in immediate profits. Enough of this kind of bunk, and let's go about our business of selling honest, safe fumigation jobs."

With Apologies

Through an unfortunate oversight credit line for the snapshots of the 4th Annual Canadian PCO Conference on page 26 of our April issue was inadvertently omitted. Snaps were, of course, made possible through courtesy of Jack Benmosche, Evins Ext. Co., N. Y., to whom we offer our sincere apologies.—Ed.

Please Note

In the Hill Termite Control System ad which appeared in the April issue, page 45, the letter "m" was left off the word "the" in the last paragraph. The word should have been "them."
Or . . . "to be installed and service by them."

Correction Please

Because of confusion of pictures appearing in the April issue, we regret the error made on page 38, "Personality on Parade" where a group picture of Southern PCO Conference attendance was headed "Purdue PCO Conference." This should have been headed "Southern PCO Conference."

Notice

MAX ROSENTHAL, National Advertising Representative of Pests magazine, is now located at 120 Liberty Street, New York City 6, N. Y., telephone: COrtlandt 7-8323.

Notice

We are glad to print personal items of interest. Send us interesting or newsy items about yourself or your family. This magazine is for the Pest Control Industry, and news about YOU is interesting

BUETTNER TRIBUTE LAUDED

Two letters in praise of Charles Pomerantz's heart-warming tribute to "Bill" Buettner, "So Deep are the Roots of Appreciation" (February 1946), follow:

☆ ☆ ☆

I must congratulate you on your tribute to Bill as printed in the February issue of PESTS. I read it with keen satisfaction for I question if anyone knows better than I the untold good, Bill Buettner has done, not only for pest control operators, but for all mankind. Actually, tears came to my eyes as I read your marvelous tribute to our Bill.

Thanks to you for the wonderful tribute you have given to a wonderful man.

—J. J. Davis, Chief in Entomology,
Purdue University Agricultural
Experiment Station, Lafayette, Ind.

Every "once in a 'coon's age" someone manages to say something that has the genuine ring of truth when uttering at a dinner meeting "a few words of appreciation" for an individual's services. In my opinion you "rang the bell" in your, "So Deep are the Roots of Appreciation" address before the Professional Exterminators Association of New York, which I have just read in Pests.

Surely no one at all familiar with the work "Bill" Buettner is doing in behalf of the Pest Control Operators' industry would disagree with a single word of your praise. My feeling is that his activities definitely have benefited even many manufacturers of products used by that industry. It has occurred to me, however, that perhaps your finest compliment was the appreciation expressed for Bill's "thunder at our wrongdoings", for it takes a very special variety of moral courage to tell one's own business group of its collective "wrongdoings". It requires the burning flame of a high sense of personal responsibility, which is only another way of saying that Bill Buettner is unafraid of life.

—C. O. Barnard, Sales Manager,
Insecticide Dept., American
Cyanamid & Chemical Corp.,
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New Jersey Pest Control Association's Annual Short Course at Rutgers University

THE NEW JERSEY Pest Control Association continued the progressive pace it set three years ago by again completing an outstanding Short Course.

The first two days were devoted to rat control, and this session was expertly conducted by Mr. Ernest M. Mills, Biologist, Rodent Control, Fish and Wildlife Service, U. S. Department of Interior. The practical and expert manner in which Mr. Mills handled the lectures, demonstrations, and class exercises, as well as the field work clearly demonstrates his understanding of our industry's needs. This rat course was unique in that both theory and practice were judiciously combined to enable the students to put into action in the field, that which they were taught in the laboratory and classroom. The course covered the three principles of rat control, namely: Rat Proofing, Sanitation, and Extermination. All instructions were geared to the needs of the servicemen and a class exercise by all the students included the mixing of one pound lots of dry food and dry poisons; dry food and wet poisons; wet food and dry poisons; and wet food and wet poisons. The mixing equipment used was the kind that a serviceman would have available to him in the field. Quantitative analysis tests were run to ascertain the actual percentage of poisons in bait size pieces. Batches of baits were also made with an electric mixer and comparisons were made to determine the efficiency of hand and mechanical mixing. This exercise period not only proved to be good practice for the men but those whose percentage of poisons to food were not in the same ratio as called for in the original formula were impressed with the necessity of more careful mixing and compounding.

Among the demonstrations at this course was the making and using of a 10% stock solution of Thallium Sulfate; demonstrations that rats will accept more readily a bait made with Squill extract than baits made with Powdered Squill, although both finished baits were wet and appeared to be of the same consistency; the making of a Zinc Phosphide Oil Solution for a dry bait; the effectiveness of tracking poisons by using 5%, 50%, and 100% Antu in a specially constructed runway; the action of Calcium Cyanide and Chloropicrin in a specially constructed fumitorium; the action of 1080 with normal, half normal and twice the normal concentration; as well as the efficiency and sensitivity of various rat traps. Food preference tests were run on both conditioned rats and normal rats. Both groups were offered the same types of foods and both groups showed a definite preference to canned pumpkin over freshly-ground hamburger, canned salmon, rolled oats, dehydrated dog food and peanut hearts. Over 100 white rats were used in the tests, experiments and demonstrations.

The course included the surveying of a rat-infested factory and after having completed the Rat Survey Form the group returned to the classroom and discussed the necessary treatments. A special committee was appointed to carry out the recommendations and the prescribed treatment. The committee used the poisons which were mixed by the class and treated the job on Monday night. The job was checked early Tuesday morning and its findings and results were reported later in the day. The rat course was made more complete by the inclusion of a lecture by Dr. Leslie Stauber, Assistant Professor of Zoology, Rutgers University, on the "Rodent Diseases Transmissible to Man," and instructions on the "External Parasites of Rats" by Dr. John B. Schmitt, Assistant Professor and Research Specialist, Department of Entomology, Rutgers University. The Manual supplied and used in the rat control section of the course has been designed as a reference and contains much more information than an outline and will prove to be an invaluable and constant source of information.

The next two days were devoted to the study and practice of termite control. This section of the Short Course was directed and conducted by Dr. Thomas E. Snyder, Senior Entomologist, Forest Insect Investigations, Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture, Washington, D. C. After a morning lecture on the natural history and methods of termite control the class spent the balance of the time in crawling, chopping, boring, and performing all other functions in inspecting and treating a termite job. Many of the students who might have had some qualms about Dr. Snyder's ability to crawl, particularly in partially excavated areas soon realized that he must have had a lot of practice and the students had to exert themselves to keep up with him in getting in and out of some mighty tight and dirty places. A total of three buildings were inspected and two buildings were treated. The inspections were made on Wednesday afternoon and during the evening session a plan of control was decided on and the plan carried out the next day. The group was divided into two squads of 25, each having a foreman in charge, and all the necessary work of drilling, treating the soil, patching the concrete, and replacing of structurally unsound lumber was completed in one day. The students were able to see both jobs and observe the proceedure, theories, and practices of termite control. Dr. Snyder who was in constant supervision of both jobs expressed his approval to the type of work that was being done.

Though a great many of the students finished the course with freshly raised blisters, aching muscles, and peculiar sensations that come from using an electric hammer for the first time, they nevertheless expressed great satisfaction for having been able to participate in a termite job which was done according to the most recommended and accepted practices. The scholarly and practial sessions will be long remembered by those who had the privilege of attending.

The Short Course ended with the awarding of a "Certificate of Attendance" which is the procedure in all Regular Short Courses offered by Rutgers University. Professor Frank G. Helyar, Director of Resident Instruction honored the group by personally distributing the "Diplomas" and expressed the thought that from the activities he had seen and which were reported to him, and by the looks of the men who were still in overalls he felt that this class really "worked" for the certificates which they were getting.

The Educational Committee of the New Jersey Pest Control Association which arranged for the materials, supplies and other details, regretted the necessity of turning away so many applicants. This course, of necessity had to be confined to but 50 students and no more than that number could be enrolled.

This is a "before" picture of the students and faculty of the termite session at the Rutgers Short Course. We are not publishing an "after" picture of this group, not because they are such vain creatures, but because this group could have been too easily mistaken for a roving troop of broken-down minstrels or over worked coal miners.

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The Fourth Annual Canadian Pest Control Operators' Conference

THE Fourth Canadian Conference, held at the University of Montreal, closed on February 20th after three days of well-attended meetings. The record registration of one hundred and fifty-three (153) proved to be highly cooperative, which made for the feeling of satisfaction displayed by every one on their departure from Montreal.

The first day was devoted to a review of the fundamentals of chemistry and to discussions of the new chemicals. The first part of this full-day session was under the direction of Professors Roger Barre, Assistant Director of the Institute of Chemistry and Secretary of the Faculty of Pharmacy at the University of Montreal, assisted by Professors E. R. Bellemare, Paul Cartier, L. Desaulniers and Messrs. Paul Dubreuil and George Flemming. The second part of the program, in the form of a symposium, gave the audience an opportunity to listen to Messrs. George Flemming, G. MacNay, M. B. Dunn, E. M. Mills, W. O. Buettner, A. M. W. Carter and to Doctors V. Froelicher, C. R. Twinn and Alfred Weed. Several problems were elucidated on the new and the newer chemicals: DDT, sodium fluoroacetate (1080), alphanaphthylthiourea (Antu), benzine hexachloride (666), etc. The first day ended by the presentation of movies on the biology and the control of rats.

Tuesday morning was "Safety in Pest Control" Session. The Shaeffer Prone Pressure Method of resuscitation was demonstrated under the direction of a member of the St. John Ambulance Association. New gas masks were shown and their use explained by representatives of the Mine Safety Appliance Co., of Canada, Ltd. While Mr. Bartlett W. Eldredge, Chairman, N.P.C.A. Fumigation Committee, discussed Gas Mask Canisters and how these afford protection to the fumigators. First Aid Kits were displayed and their use was explained by Dr. G. H. Chapman, American Cyanamid & Chemical Corporation, New York, and Ed. Gentle, a Hamilton, Ont., fumigator who had prepared a kit of his own to take care of most accidents that may happen in any phase of pest control operations.

The Tuesday afternoon session afforded the pest control operators an opportunity for showing that sound scientific experimentations are not out of the scope of their ability. M. A. Sanderson, Reliable Exterminators, Ltd., Toronto, discussed rat survey forms which he has been using in his own service operations, while E. M. Mills, U. S. Fish and Wildlife Service, promoted the advantages of keeping rat bait records. This was followed by a report from Jack Rudick, Western Exterminating Co., Montreal, of experiments carried out in view of obtaining a better dispersion of poisons into rat baits. The use of a coloring matter was advocated as an "indicator" to show when thorough mixing of the various ingredients used has been achieved. Then, J. C. Otis, Mysto, Inc., Montreal, gave comparative results of rat bait acceptance obtained when incorporating various attractants or appetizers (lures) into the bait materials.

Despite the fact that this was the morning after the "Reception Party" and despite a heavy snowstorm which had somewhat paralyzed the traffic, the Wednesday morning session started only half an hour late. A lively discussion took place around the papers presented at the Rodenticides Session and this was followed by an Insect Identification Class and laboratory exercise under the direction of Father O. Fournier. This last session ended just in time to clear the laboratory room for the regular university students afternoon class and to permit the P.C.O.'s to catch a "bite" to eat.

The last session of the Conference was given over to discussing new fields of application for pest control services and demonstrations of new aids for the pest control operator. J. B. Maltais, officer in charge of one of the Dominion Entomological Laboratories gave the results of moth-proofing experiments with DDT solutions. H. A. U. Monro of the Plant Protection Division, Canadian Department of Agriculture, talked about the fumigation of commodities in river barges and then demonstrated the possible application of "Smoke Generators" in detecting leaks in structures prior to fumigation. Mr. Monro was assisted by Captain G. C. Wilson of the Chemical Warfare Laboratory, Canadian Department of National Defense, and the demonstration was carried out in a midget box-car built to scale. Some one was heard to remark that everybody "coughingly" agreed that smoke bombs had a place in a fumigator's kit.

Then there were displayed, demonstrated and discussed new instruments of potential aid for the pest control operator such as spray nozzles, by H. L. Colt; an ultra-violet lamp which may have some use for detecting the presence of rats, by Ted Riedeburg; a bait-box featuring a lunch counter, if you please, for the safe exposure of poison baits or drinks, by W. J. Stover.

Thus ended a three-day conference every moment of which was filled with intense interest, three days of hard work with a fair amount of time for private chats between members.

Those men who are good at work are usually good at play and this was well demonstrated at the "Reception Night" when the members, the guests and the ladies got together at the Prince of Wales Salon of the Windsor Hotel for an informal evening of good old fun. The impromptu entertainment was supplied by the members themselves who were introduced by an improvised but nonetheless super-excellent Master of Ceremonies; on a half-hour notice, Sidney Wimmer became master of ceremonies, talents recruiter, and made the whole attendance roar with laughter. The program was a varied one, with Byron Kaufman doing his card tricks, Health Inspector Albert Clarey and his "Music Hall" act, Mrs. DaSylva in a French folklore song "Alouette" (not to be pronounced "All Wet"!), Walter Blank as a Montreal official guide (a repetition of his sight-seeing tour with the ladies earlier in the day), Sol. Emanuel and his old-time comic songs, etc. . . . All this interspersed with Sidney's choicest yarns. There were also a few surprise numbers, but the surprise was not so much on the audience as on the performers . . . as usual, Bill Buettner, could be felt, if not found, behind the surprises.

The ladies' program took in a visit to the famous St. Joseph Shrines and the Wax Museum and ended at the University of Montreal Dietetics Department where tea was served to them. As a guide, to explain the site en route, Walter Blank, who was in Montreal for his first time, surpassed himself and made the bus shake with laughter. It is said that the tears which obscured the sight of the ladies made them miss a number of monuments and that theirs in the eyes of the bus driver forced him to slow down the speed of his vehicle.

The Annual Dinner of the Association was attended by over one hundred and forty. The retiring President of the Canadian Pest Control Operators Association, Mr. C. E. Ryder, presided and the guest speaker for the evening was Mr. W. O. Buettner. Among the other speakers were Msgr. Olivier Maurault, Rector of the University of Montreal, Dr. Arthur Leveille, Dean of the Faculty of Science, C. E. Ryder, Professor E. R. Bellemare, Secretary of the Canadian Pest Control Operators Association and Vice-President E. F. Abell who also acted as master of ceremonies.

At the Annual Business Session, held after the three-day conference, a new Board of Directors was elected as follows, for the year 1946-1947:

PRESIDENT

A. Friedman, Superior Sanitary Service Reg'd, 1226 St. Urbain St., Montreal, Que.

VICE-PRESIDENTS

Western Territory: Charles Riess, Chas. Riess & Co., 372 Colony Street, Winnipeg, Man.

Central Territory: R. W. Menzie, Derpo Ltd., 5 Orpen Avenue, Toronto, Ont.

Eastern Territory: Jack Rudick, Western Exterminating Co., 2449 Notre Dame St. W., Montreal 3, Que.

DIRECTORS

F. M. Smith, Empire Fumigating Co., Ltd., 300 Alexander St., Vancouver, B. C.

M. B. Dunn, Ottawa Pest Control Service, 375½ Somerset St. West, Ottawa, Ont.

H. A. Maheu, Maheu & Maheu, 145 Bridge St., Quebec, Que.

J. L. McNulty, Maritime Fumigators & Exterm., 94½ Princess St., St. John, N. B.

SECRETARY-TREASURER

C. E. Ryder, Pest Control Clinic, 149 James St. North, Hamilton, Ont.

PAST-PRESIDENTS

W. S. Bomby, Ocean Chemicals, Ltd., Rear 259-275 Danforth Ave., Toronto, Ont.

3 DDT Preparations for the Insecticide Manufacturer

Today Penn Salt technicians are applying just as much effort and skill to the development of DDT as they did during the war. Only now their products are for all of us to use, and their purpose is not the stamping out of typhus in Italy but the controlling of insect pests here at home. A number of new preparations have recently been put on the market which are designed for the use of manufacturers creating their own formulations for domestic and farm insecticides. Here are three which may be just what you are looking for:

PENCO DB-50

—a specially compounded dry powdered dust base containing 50% DDT. This product is designed for use by insecticide manufacturers in the formulation of finished dusts for agricultural and household purposes.

PENCO SOLVENT CONCENTRATE

—a specially developed concentrate designed for use by insecticide manufacturers who do not desire to work from technical DDT. This product can be used for the manufacture of insect sprays.

PENCO DDT-TECHNICAL

—a fine to medium white granulated powder. It has a setting point of not less than 89° C. PENCO DDT-TECHNICAL is used by insecticide manufacturers who make their own formulations of DDT concentrates and finished products.

For prepared sprays use **PENCO WB-50**—a 50% DDT spray base.

PENCO EMULSION CONCENTRATE—a specially developed concentrate for use as a water emulsion spray where a minimum visual residue is desired.

PENCO CATTLE SPRAY—a dry wettable powder containing 50% DDT which is stable in water suspensions.

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P. W. McLeod, Service Fumigating & Pest Control Co., 844 Kingsway, Vancouver, B. C.

C. E. Ryder, Pest Control Clinic, 149 James Street North, Hamilton, Ont.

Prof. E. R. Bellemare had previously announced that circumstances forced him to decline all invitations to serve another term as Secretary. Tributes of appreciation were paid "Eddie" Bellemare by all present for the "outstanding services he had rendered as Secretary of the Canadian Pest Control Operators Association." Eddie was unanimously elected an honorary member.

Plans for the Fifth Annual Conference at the University of Montreal are already under way. In his letter to those who have attended this year's conference, the Conference Chairman invited all those who intend to be at the 1947 Conference to take some time out to review their most pressing needs and then let the Chairman know on which phase of pest control activities they would like emphasis placed. Closer cooperation between the members of the industry and the members of the University Faculty will make for more profitable and more "to the point" conferences. A good example of what pest control operators can do was given this year at the Rodenticides Session; more is expected of them next year.

RHothane D-3 In The Pest Control Field

By **JOHN ALSTERLUND**

Editor's Note: The following paper was read by Dr. John Alsterlund of the Research Staff of Rohm and Haas at the Sixth Annual PCO Conference held at Massachusetts State College, Amherst, Mass., February 4-6, 1946.

EARLY in 1943, shortly after the initial disclosure concerning the effectiveness of DDT, the Rohm and Haas Company inaugurated an intensive investigation into the chemistry and toxicology of chlorinated hydrocarbons. A large number of new compounds were synthesized in our chemical laboratories, among them a number of compounds closely resembling DDT. One of the latter group, dichloro-diphenyl-dichloroethane, showed high insecticidal value in our biological tests. Additional research of a physiological nature showed this compound to be also markedly less toxic to warm blooded animals than DDT. It has been given intensive development, and now carries the trade-name "RHothane D-3."

As might be expected from its close chemical relationship to DDT, RHothane D-3 is very similar to DDT in its physical characteristics. In pure form it is a white crystalline solid. The solubility of RHothane D-3 in the commonly used solvents such as mineral oils, xylol, and the polymethyl naphthalenes, is virtually the same as for DDT, and for the purposes of mixing, grinding, and formulation it may be used in the same manner as DDT. RHothane D-3 will be made available commercially as a 25% liquid concentrate, a 50% dust concentrate, a 50% wettable powder, and as the technical grade crystalline compound.

The effectiveness of RHothane D-3 in insect control also parallels closely that of DDT. RHothane D-3 is toxic to the same insects and groups of insects, and when used at strengths giving relatively good or commercial type control it is of the same order of effectiveness as DDT in most instances. RHothane D-3, like DDT, is a rather slow-acting toxicant and can often be advantageously combined with other more rapidly acting materials, such as pyrethrum or the Lethanes, for best results. This applies particularly to the pest control field.

For instance, RHothane D-3 is highly toxic to houseflies. One-half percent of the compound when combined with a suitable knockdown agent will give approximately one hundred percent kill of houseflies by the Peet-Grady method. In concentrations as low as one-fourth percent it will produce high-grade fly sprays.

RHothane D-3 gives kill of German and American roaches equal to the O.T.I. when used at from one to two percent in mineral oil, and our data show that this performance compares favorably with that of DDT on these insects. However, from our experience in practical pest control work, we consider neither DDT nor RHothane D-3 to be adequate for efficient roach cleanup work unless used with a suitable drive-out agent, to force the roaches out of hiding.

With respect to roach powders also, we have found Rhothane D-3 and DDT to be equal in their effectiveness. However, it is our feeling that both materials are too slow in their action on roaches to be satisfactory roach powders in commercial practice. We have found that mixtures of RHothane D-3 or DDT with faster-acting roach toxicants give not only more rapid but more consistent control of the two above-mentioned species of roaches. We have been unable to find in either laboratory or practical work that residues resulting from RHothane D-3 or DDT spraying have any measurable effect on roach control.

Bedbugs are one of the most important of the pest control operators' problems. Our data indicate that RHothane D-3 in dilutions giving commercial control is fully the equal of DDT as a direct spray. We have no data as yet on the effect of RHothane D-3 spray residue in bedbug control. The possibilities of RHothane D-3 here may be of interest to the Research Committee of the National Pest Control Association.

RHothane D-3 has shown high toxicity to fleas. Our work here has been confined to use of the material in dust form, principally as a treatment on domestic animals. We would suggest a powder formula consisting of 5% Rhothane D-3 and 75% Lethane A-70 for most effective results. In this case RHothane D-3 gives good residual protection, and the latter material contributes ovicidal action and desirable speed of kill.

Brief mention might be made of the place of Rhothane D-3 in the agricultural field. It has already been demonstrated to be a very effective material for the control of insects on potatoes and on cruciferous crops. Extensive investigations are under way on the use of RHothane D-3 on many other agricultural crops, and the indications are that it will prove to be a valuable new insecticide in this field.

Finally, the relative safety of RHothane D-3 to warm-blooded animals, compared with DDT, is important. Our investigations with respect to this point, both from the standpoint of acute and chronic toxicity, have been carried on for over a year, and studies are being continued for at least another year. Enough data have been accumulated, however, so that we may say that RHothane D-3, depending upon the species of animal involved and the method of administration of the toxicant, is not more than from one-fourth to one-tenth as toxic as DDT, with the average toxicity to experimental animals being approximately one-fifth that of DDT. This important distinction between RHothane D-3 and DDT is of obvious interest to all pest control operators, and in particular to those working in restaurants and other establishments where food contamination is a problem.

The foregoing summarized statement should serve to illustrate the probable usefulness of Rhothane D-3 in competition with DDT in the pest control field. Although incomplete, the general picture of insect toxicity presented for RHothane D-3, together with its wider margin of safety to warm-blooded animals, should, we feel, offer interesting possibilities for pest control operators.

We regret that RHothane D-3 will not be available in commercial quantities for a number of months. However, experimental samples for extensive testing work should be available in the reasonably near future. We are interested in filling the present gaps in our data on RHothane D-3, particularly in the field of practical commercial work in pest control, and for that reason we shall be very glad to cooperate with qualified operators in securing this type of information. Our laboratory is ready to suggest improved formulations and combinations to meet specific problems in pest control.

Specifications for Aerosols Offered

Because of popular interest in aerosol "bombs," well known as a military defense against mosquitoes and now being sold to the civilian public, AIF NEWS queried one of the manufacturers for exact details. Here is the reply:

"Size is approximately three inches in diameter and six inches end to end. Net contents is one pound.

"The bomb will spray over 10 minutes. It contains 530 to 540 grams and discharges at the rate of 40 grams a minute.

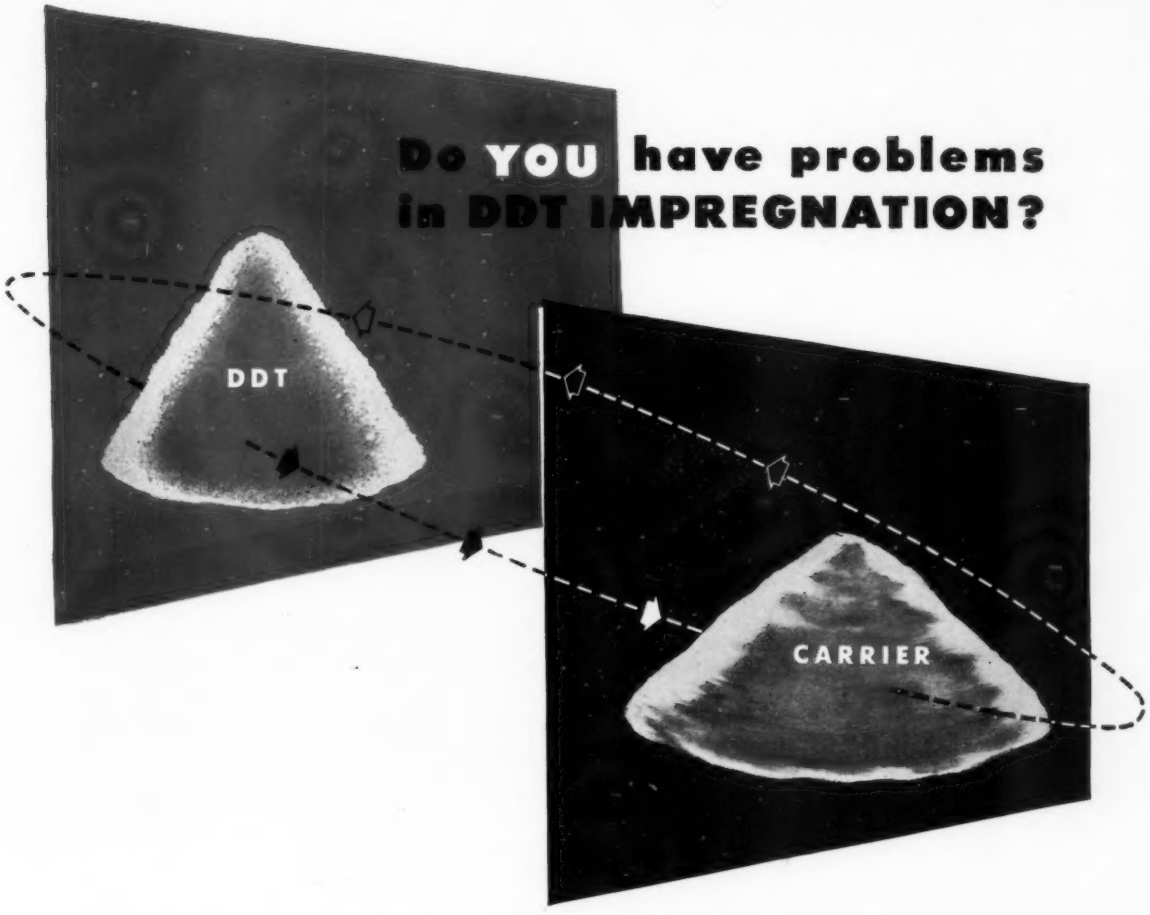
"To kill flies and mosquitoes, it should be opened 4 to 6 seconds for (each) 1000 cubic feet of space.

"The formula is covered by the Goodhue patent owned by U. S. Department of Agriculture, No. 2,321,023. It is:

3% dichloro-diphenyl-trichloroethane (DDT)
2% pyrethrum extract 20% pyrethrins
15% polymerized alkylated naphthalene (APS 202)
80% dichlorodifluoromethane.

"During the war we supplied the Navy with this item. The Navy required containers to meet ICC specifications as to specific construction, inspection and tests for compressed gas cylinders.

"We appreciate the tendency of the public to over-use any aerosol product, and feel that any information as to proper use will be beneficial."



The wax-like nature and tendency toward fusion exhibited by DDT present problems in the preparation and compounding of insecticidal powders and dusts. The finished mixture must retain required flowability—the grinding process simplified. Attaclay, the new, porous, finely divided insecticide carrier and diluent, has properties helpful in overcoming these mixing problems.

Over the range of concentrations currently in use commercially, ATTACLAY-DDT mixtures exhibit high flowability. Furthermore, the adoption of Attaclay as carrier and diluent in DDT mixtures always minimizes grinding problems.

Because of its chemical compatibility, Attaclay helps maintain high toxicity in DDT mixtures.

Whether your process involves use of DDT or other insecticides, Attaclay's unique properties as a carrier and diluent merit consideration. We shall be pleased to send an adequate sample for testing. Just write to

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Some Scenes from the Fourth Annual Canadian PCO Conference*

Eddie (E. R. Bellemare) asking Dr. Froelicher (in the audience) whether there will be any royalties asked for the DDT being synthetized in the apparatus shown on table in background. In the foreground, molecular chains of DDT, benzene and gammexane (666).

No, sir! Ernie (E. M. Mills) is not asleep! Just watch Bill's concentrated attention and the interested backside attitude of the boys.

Sandy (M. A. Sanderson) sends a "shot" of poison solution into an orange with a hypodermic syringe at the "Rodenticides" session.

Prof. Paul Cartier analyzing poison concentrations in rat bait samples variously mixed.

At the Banquet head-table from right to left: Frank M. Smith, Vancouver, B. C., representing the Pacific Coast; V.-Pres. Chas. Riess, Winnipeg; Father O. Fournier, Univ. of Montreal; N.P.C.A. Sec. Wm. O. Buettner; V.-Pres. E. F. Abell, Toronto, Master of Ceremonies; C.P.C.O.A. Sec. Prof. E. R. Bellemare; Pres C. E. Ryder, Hamilton; Dean Arthur Leveille, Univ. of Montreal; E. M. Mills, Fish and Wildlife Service, U. S. Dept. of the Interior; not showing on the photograph: V.-Pres. Jack Rudick, Montreal and R. L. Schurman representing the Atlantic Coast.

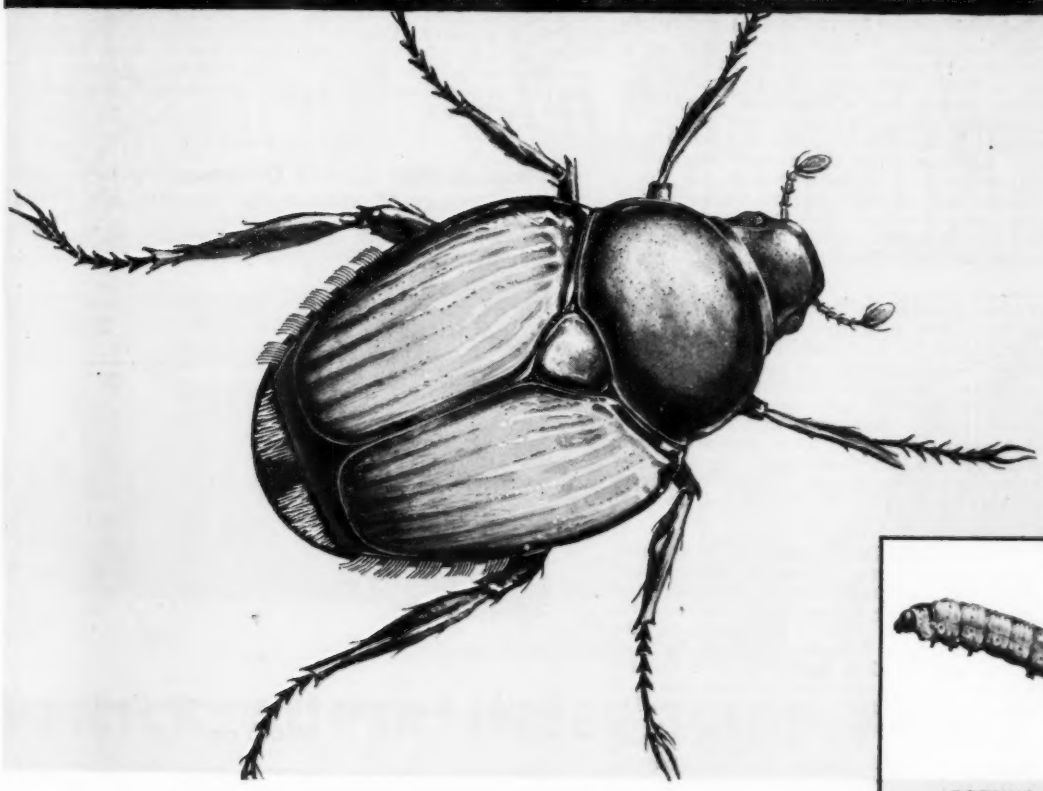
Msgr. Olivier Maurault, Rector of the University of Montreal, hands Bert Menzie a souvenir to be taken to Past-President W. S. Bomby who was unable to attend.

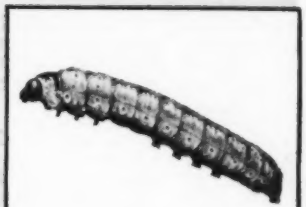
Judging from the physiognomies of his auditors, Pres. C. E. Ryder can and does pass along some highly soberizing thoughts . . . See counterpart in photo No. 8 and you know the man!

Isn't that a warm, gleeful smile? At that moment, C. E. was not quite a Past-President yet, but he was a would-be Secretary which he is now.

Photo courtesy Dr. E. R. Bellemare, Conference Chairman.

JAPANESE BEETLE—attacks soybeans, corn, and many other vegetables and fruits





CODLING MOTH

JAPANESE BEETLE

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(Dichloro-diphenyl-trichloroethane)

PROMISES CONTROL OF THIS PEST

The Japanese beetle gets in most of its deadly work throughout the Eastern states where it is the scourge of soybeans, corn, and many other vegetables and fruits. The Japanese beetle is one of the six major crop pests against which the use of DDT has proved effective.

United States Department of Agriculture tests indicate that this troublesome beetle may be effectively controlled through the use of DDT in the soil or as a spray on fruit trees.

DDT also promises effective control of such major crop pests as the codling moth and the Colorado potato beetle. As tests in the agricultural field, to be conclusive, require several growing seasons, only tentative formulation recommendations are available at this time.

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BIRDS OF A FEATHER

By ARNOLD MALLIS

RECENTLY in Philadelphia spouse berated spouse, and neighbor snubbed neighbor; bags beneath slumberless eyes became long and tempers became short. In fact, a section of the City of Friends became decidedly unfriendly, all because of the outrageous and mysterious snoring that dismembered sleep each night. The unhappy inhabitants called for the police; the police called for the detectives, and these in turn called in several professors in the University of Pennsylvania. After some determined and desperate sleuthing on the part of these experts the sleep-robbing culprits were apprehended—young barn owls clamoring for food! Only the state game laws preserved these creatures from an awful and inexorable fate. Fortunately the birds departed for parts unknown, and quiet and restful nights descended once again on the neighborhood.

The city fathers of New York, Philadelphia, Washington, and San Francisco, to name but a few municipalities, have furrowed their brows and grown gray over the bird problem. Pigeons, starlings, and sparrows perch on ledges, cornices, and architectural frills and make uninvited auditions over radio networks; rob hotel patrons of their sleep; deface churches and other buildings with their droppings, and indeed make it hazardous to walk on some streets. Their nests, moreover, may serve as a source for the entrance into the home of various household pests. Pigeons have even been accused of carrying a virus disease, resembling parrot fever, that can be contracted by human beings in the form of pneumonia.

Where the control of a pest is at best imperfect, the methods utilized are legion. There never has been a housing shortage for birds in Washington, D. C., for the ornate columns and ledges of the stately buildings are ideal roosting places. In a few instances a sloping board at a 45 degree angle made it impossible for the birds to roost, as they were unable to obtain a toe-hold. Fifty to sixty stuffed owls set around one building proved to be a failure; the starlings merely cuddled up to the specimens to keep warm. A fire hose turned on the birds did not faze them in the least. The starlings fluttered around, shook themselves off and returned to the ledges. Thousands of brightly-colored balloons attached to long strings and patrolled night after night through the nesting areas left the birds entirely undismayed. Automatic noisemakers and dangling telephone books fluttering in the wind were no more successful.

In San Francisco the authorities snared the pigeons in a public square and incarcerated them in crates with the intention of hauling the pigeons far from the maddening crowd. During the night, however, the pigeons and crates disappeared, and there are those who believe that the pigeons and the then current meat shortage were solved at one and the same time. Obviously a shot gun is taboo in the city, and even a Sergeant York would have difficulty in disposing of the pigeons with a single-shot air rifle for the birds must be hit in the head to be affected to any degree. Moreover, in most municipalities pigeons are protected by the law.

The inhabitants of Shreveport, Louisiana, are proud of the bird life of Audubon's home state, but the thousands of starlings that dwelled in the oaks in the courthouse square were too much of a good thing. They twittered incessantly, indiscriminately spotted the landscape, buildings, and passersby, and so enervated the nearby residents that these in desperation appealed to the police to cut down the oak trees. The police were easily persuaded since they were fellow sufferers. However, no sooner did they announce their decisions to remove the old oak trees and their noisy residents then the nature-lovers raised a clamor which rose even above the din of the starlings, and a restraining order forced the police to desist. Although the experts could give no positive aid in ridding the square of the birds, they were certain that felling the trees was not the solution. When last heard of the residents of the square were still going around in circles, and were importing squirrels to disturb the starlings and their nests. There were even some cynics who observed that squirrels and birds have been living together in trees for a long, long time.

In another section of the country high school boys discharged Roman candles at dusk to shoo sparrows and starlings from the main street of a business district. Smudge pots containing sulfur candles suspended from the branches of the trees had some luck in driving bird pests from the trees. As a whole, there is no simple remedy since even if the birds are forced to leave a specific locality, they usually return after some days or weeks have elapsed. Whenever possible the nests and eggs are removed or destroyed, and then action is taken to cope with the adults.

There are a number of companies that specialize in the bird-proofing of buildings. These concerns operate by placing sharp stickers made of wire or galvanized iron on ledges and other places where the birds nest or rest. As a result, one can see saints on churches and gargoyles on buildings with halos of stickers. In some instances the birds are hardly inconvenienced since they merely move to that portion of the edifice that is not bird-proofed.

It is apparent that on numerous occasions the experts have matched wits with the "bird-brains," and in most instances have emerged second best. Maybe the man who built a better mouse trap can now be prevailed upon to devote his talents to making unwanted birds unwelcome!

Wisconsin Pest Control Operators Meeting Held at University of Wisconsin, February 23, 1946.

Prof. E. H. Fisher, Extension Specialist in Economic Entomology, University of Wisconsin (inset).

Critical Rotenone Shortage to Continue Until Mid-Year

Rotenone insecticide shortages during the early part of this season will be worse than during the war.

The situation had appeared to be hopeful. Now, information only recently made available shows that shipments from Peru since Fall have dwindled while the docks at Iquitos on the upper Amazon have been piling high with the urgently needed barbasco root—the rotenone source.

The facts were checked at an emergency conference of importers, processors, manufacturers and government representatives. Comparing notes, it developed that the import shipments—made exclusively by the government since early in the war—have been scanty for several months and arrivals of root here will continue light until late April. Expected heavier arrivals in May and June would be too late to help many United States crops.

The industry asked the government to renew for one year, if possible, the four-year trade agreement with Peru, which expires May 7 and which has routed all Peruvian barbasco to the United States; also to end the public purchase program March 31 so that American industry once more could do its own buying and importing. Private importers maintain they are better acquainted with the Peruvian producers and in better position to use initiative in arranging transportation from Iquitos.

The Entomologists' Joke-Book

There are so many new faces in our membership that we felt it of this splendid book of humorous writings and comments . . . unwittingly written . . . of an otherwise highly important science. The preparation of this book was done by Professor J. J. Davis, who has carefully compiled and selected much interesting material. This book may be purchased for $1.00 plus 10 cents in stamps to cover mailing postage. No PCO should be without this book in his library. Also order now before you forget—very simple to enclose a $1.00 bill and 10c in stamps.

This will make an excellent gift to PCO's in service and others.

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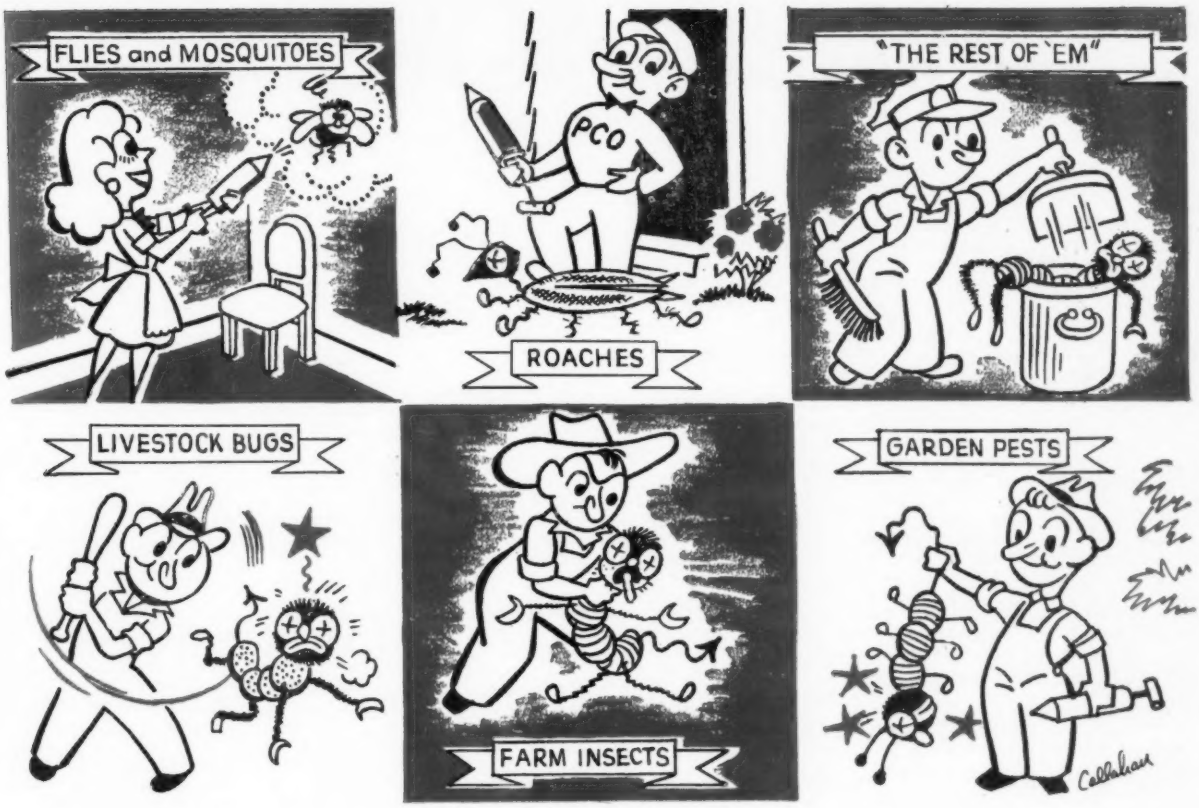

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100 TERMITE INSPECTIONS

By **ROBERT E. HACKLEY,** ***Palo Alto, California***

HOW INJURIOUS to our homes are termites and how far will it pay to go in spending money for termite control? That these insects are very destructive in tropical countries is a matter of common knowledge. But the average citizen of the United States has very little accurate information about their activities in his home town.

Actually, there are great differences in the importance of these creatures in different parts of the world, and there are also variations within the borders of a single state.

In order to establish a basis of facts for consideration of this question in one section of California, reports covering termite inspections of 100 houses have been studied. These inspections cover houses of various types of construction. The oldest house reported on was about forty years old and the newest had been built only about two years. All were situated in an area of about twenty square miles close to San Francisco Bay. No commercial or industrial properties were included in the survey. Most of the inspections were made in connection with the proposed purchase of a home and for the protection of the buyer; but some were made at the insistance of owners who thought termites might be "working" on their houses. None of the inspections was made to promote the termite business or for the especial purposes of this study. The reports were taken at random from the files.

Since the correction of fungus and beetle injuries is an essential part of the termite business in the locality concerned, these organisms also were included in the survey.

Although eighty-three of the houses either showed definite signs of these destructive agencies or else had somewhere about them wood in contact with the ground or some other condition of the kind usually held to be favorable for subterranean termite or fungus attack, only a few houses were found to be seriously injured.

Subterranean termites and fungus frequently were found together. As nearly as could be estimated fungus caused about twice as much injury as the termites did. Even allowing liberally for the impossibility of making an exact division between the effects of fungus and termites when the two are mingled, as they so often are, the predominance of fungus as a destructive agency remains very striking. Termites have been "stealing the show" in the territory included in the survey.

Beetle infestation was found in three cases and dry-wood termites appeared only once. No proof of the presence of damp-wood termites was found.

The small number of cases in which dry-wood termites and beetles were found hardly furnish a satisfactory basis for discussing these insects, except to say that as compared with subterranean termites they are relatively scarce. So, in order to get a better picture of the situation, some cases not found in the survey will be considered. Dry-wood termites are found in widely-separated parts of the territory, with an infestation here and there. A concentration was noted at one point. The first house known to be infested came to the attention of the writer something over twenty years ago. Today no less than six other infestations are known to exist within a few blocks of the original discovery. It is quite possible that the spreading of these insects from one house to another may prove to be a serious matter as time goes on. So far as known the injuries have been of a minor nature.

Beetles were found in hardwood floors, in panels and doors and in the fir and other timber used for joists and studding. In one house only two or three years old the oak flooring was considerably spotted with holes.

In respect to subterranean termites and fungus, the data are more ample and a fuller discussion is possible.

The conditions attending the eighty-three houses which were rated as being either infested to some degree or theoretically vulnerable to termites and fungus are described in some detail as follows.

In eleven instances, injury was found in wooden porches, cellar stairs or wooden supports underneath concrete-floored porches. Its importance ranged from a minor and almost negligible deterioration in the bottom of the back steps to a condition in an old house where complete rebuilding of the front porch was recommended. Exposure to the weather was a large cause of the trouble in these cases.

In twelve other cases, damage was found in the main walls, in floor supports or adjoining timbers, or in the floors themselves. In one of these cases, the injury was nothing more than a little rotting around a toilet bowl caused by a leak in a drain connection. In eight cases out of the twelve, the injury was small and did not impair the strength of the building; but it was considered to be likely to spread and become worse. In the remaining three cases from fifteen to thirty feet of main wall and adjoining timber were involved to a serious extent.

Twenty-two houses showed a distinctly minor infestation and thirty-eight others had wood in contact with the ground, sills or ventilator frames lower than the landscape grade, earth-filled porches, concrete form boards or scrap lumber under the house, or they were poorly ventilated or were suject to damp-producing conditions. No structural injury was found in either of these two groups numbering sixty houses.

Only seventeen houses were rated as free from signs of termites or rot or free from the conditions commonly supposed to be favorable for their development.

One of the facts shown by this survey is that subterranean termites do not always take full advantage of the opportunities set before them. Among the older houses in the survey four stand out as conspicuous examples of this. They were built about forty years ago and in all of them wood was in contact with the soil to a considerable extent. All of them have shingle siding. One of them was built on a wooden sill resting on the ground. This one showed a little rotting around the steps with a few signs of termites. Two of them did not show any termite or fungus injury. In the fourth the exposed cellar stairs and door frame were in a sad state from the combined effects of rot, termites and weathering.

In sharp contract with these four older houses is a stucco house with a concrete foundation, built about two years ago. This structure had a vigorous rot infection in one corner with a ventilator only a few feet away on either side of the infection.

In one of the cases in the survey in which serious injury was found, part of the infestation arose from termite tubes built over the out-of-doors face of the concrete foundation in the full open air and daylight. No less than a dozen such tubes crossed a stretch of twelve inches of concrete foundation between the landscape grade and the wooden siding of the house.

In another case, caught before any harm resulted, termites built a tunnel up thirty inches of concrete foundation in a very dry basement. One inch more, and the sill would have been reached. They came through the joint between the foundation and a two-inch thick layer of concrete rat-proofing which covered the ground under the house.

Houses which, according to current theory, must be rated as vulnerable, sometimes escape injury of a serious kind for as long as forty years. And some which might be expected to be resistant may be attacked in the first two years of their life. Contacts between soil and timber do not always lead to important injury in a house even over several decades. And concrete foundations, dry basements and air and light are not a sure preventive of termite action.

A prominent fact brought out in this survey is that rottting causes more injury than termites do. And it has been found that rot travels faster and farther in stucco buildings than it does in those having a wooden siding. This is probably partly because a building with wooden siding can dry out faster than one covered with stucco. A little rotting in the wooden steps of a wooden house twenty years or so sold is not necessarily a serious matter; but an appearance of rot in a comparatively new stucco house is a potentially grave matter. Recommendations should be made accordingly.

The age of a house is a very important factor to take into consideration in estimating its need for termite treatment. An old house has in a very real way proved itself. While its future may not wholly follow the pattern of its past; its record is likely to be a better guide to the future than a mere speculation based on theory.

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The aim of the termite operator is to protect houses from injury and to repair such damages as may be found. It is not his business to advise people to take chances. Yet, many occasions arise in which a thorough termite job done in accordance with current ideas of termite control may not be a wise investment for the owner to make. The operator needs to exercise good judgement and common sense. This is especially the case when the work contemplated is of a purely preventive nature and to be undertaken when actual injury is slight or even non-existent. Let us consider a few such occasions.

Suppose, for instance, a stucco house with a concrete foundation. The sills are slightly below the landscape grade part way around the house, the front porch is concrete over an earth fill, two studs between the sill and the floor plate have been weakened by termites, and the sheathing backing the earth filled under the porch shows two square feet of partially destroyed timber. The owner, a widow sixty-five years of age, has lived happily in the house for twenty years. She has enough money to see her through the remaining years if she spends it wisely. Will it be a good service to her to recommend that her house be given a standard termite treatment involving "sealing off" the front porch and raising the foundation? Probably it would not.

But suppose a young couple is buying just such a house and the lending agency stipulates that the house shall be given a standard termite treatment. Will it pay the young couple to do this work? In this case the comparative cost of doing the work and getting the loan could be reckoned against the cost of some other method of financing or against the cost of some other house. We are here not concerned about the general wisdom of doing the proposed work. The loan company has said the work must be done, and that settles the point so far as the young couple is concerned. Take it, or leave it.

Or consider one of the older houses previously referred to in this discussion. A prospective purchaser has asked for a termite report. Obviously the house is far below the standard set by current ideas of security. The loan company in this case has not been found to be very particular, but the buyer intends to modernize the house by putting on a coat of stucco, altering the partitions putting in two tiled bathrooms and redecorating the whole interior. Where such improvements are contemplated the buyer probably would be wise to add the cost of a good termite preventive reconstruction to his other costs. But suppose he has no such plans for improvements. Will he then be any better off for putting several hundred dollars into raising the foundation? The history of the house says that he will not be likely to be any better off for it.

One factor that needs to be considered is the trend of property use in the neighborhood in which the house stands. It would hardly pay to apply a purely preventive treatment at a cost of two or three hundred dollars to a house that is likely to be removed in a few years to make room for an apartment house or a service station.

This discussion is limited to a particular area. In other locations the facts may be somewhat different. In estimating the importance of termite, beetle or fungus control, due attention should be paid to the facts as they exist in the locality concerned.

When the wide variety of conditions that surround the termite business is taken into account, it is seen that the public is in need of advice from men who see their calling as being much larger than the application of a cut and dried formula for termite control. Fortunately operators are rising to the occasion and as time goes on they may be expected to become more and more capable in meeting the varied situations which confront them.

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Modern New Orleans

The following is the third of a series of articles on N. P. C. A.'s 1946 convention city.—Editor.

TWO CITIES in one is New Orleans, combination of the new and the old, with the romance and glamour of old France and Spain merging with the hustle and bustle of progressive America.

On one side of Canal Street, widest and most beautiful business thoroughfare in this country, is the Vieux Carre, preserved practically as it was two hundred years ago. On the other is the business and financial section, a youthful enterprise compared with the age of the old city, yet established as the hub of southern business.

There is nothing incongruous about it to Orleanians, who know the story of how a great and progressive city grew from a small settlement in the marshes. Part of New Orleans' development into a modern city goes back into history. But in recent years, inhabitants have seen almost eight miles of wharves and steel and concrete transit sheds constructed along the shores of the Mississippi; have watched giant planes fly into airports constructed where only ducks flew before; have seen a swampy lake shore reclaimed into several thousand acres of fine residential land; have crossed a majestic bridge over the Mississippi where many engineers said no bridge could be built; and have seen the mighty river, at flood stage, subside at the opening of a new man-made flood project. For all forms of development have taken place, as New Orleans grew from a small, antique community of half a hundred Frenchmen to the modern Crescent City of more than half a million Americans.

In the South, New Orleans is the largest city, and leading wholesale, retail, industrial and financial center. For the United States, she is the fourth largest city in area and one of its leading ports. For the world, she is the gateway to the products of the earth's richest agricultural area, the valley of the Mississippi and its tributaries, and the "AIR HUB OF THE AMERICAS."

From an economic viewpoint, New Orleans occupies an advantageous position in its location on the Mississippi River, only 110 miles from the Gulf of Mexico. At the heart of the city, the river is deep enough and wide enough to float the greatest of ships, which means that the ports of the world are within easy reach. Thirteen thousand miles of inland waterways terminate there, and make it the country's Grand Central Station for river steamboat and barge lines. Railways, motor transports and air lines complete the picture to give New Orleans distribution facilities unmatched elsewhere.

Combine these advantages with the fact that foreign raw materials enter the country at New Orleans; that around the city there is a natural storehouse of resources such as oil, sulphur and salt; and that a moderate year-round climate makes uniform, uninterrupted plant operation possible, and you have the reason why visitors will find New Orleans a thriving, modern city.

But New Orleans' greatness is as well expressed by the monuments which she had built to progress as it is by industrial preeminence. Canal Street, which now runs where once was a deep drainage canal, is not only the most beautiful, but one of the best lighted business streets in the world. An efficient white-way lighting system makes the nights as bright as day, and illuminates the neutral ground and sidewalks, which are paved with terrazzo marble.

A dream of decades became a reality when the $13,000,000 toll-free Mississippi River bridge was constructed, a direct outlet to the west for rail, highway and pedestrian traffic. Such a bridge was for a long time believed impossible because of the difficulties entailed in finding foundation, but the central pier finally found solid bottom 170 feet below Gulf level. Its total height, to the top of the superstructure, is 409 feet, equal to that of a 36-story building. From 200 to 1000 men worked on the construction, over a period of three years, finally completing the 4.4 miles structure.

Probably the most important of recent projects is the monumental Bonnet Carre Spillway, which offers further security for the city from the flood waters of the Mississippi. Although the levees of the city have not been over topped for 100 years, the Spillway offers protection, for located 35 miles above the city it removes flood crests before they become dangerous. By opening the Epillway, the high waters are diverted through a shallow basin into Lake Pontchartrain, thence out into the Gulf. The Spillway was opened for the first time in February, 1937, and proved its efficiency by lowering the river level at New Orleans several feet. At full capacity it can handle more water than flows over Niagara Falls.

Among the other modern achievements of New Orleans is Charity Hospital, which in medical circles is considered as one of the modern wonders of the world; the new Federal Building and the Southern Regional Research Laboratory which is endeavoring to find new commercial uses for the agricultural products of the South, and many new industries and military installations.

Elevated
TO A PLACE OF IMPORTANCE

Proclaimed by the Dep't of Agriculture as the most durable, rugged sprayer built . . . as the most satisfactory for residual or space spraying.

LOFSTRAND

STAINLESS STEEL
SPRAYER

Ever since the battle of insects has been fought with liquid insecticides, the insecticide itself has always taken prominence over the method of application. But to those who did the actual fighting, it was a different story. Their cry was for a sprayer that could do justice to the powerful "killers" being developed. It was impossible to get sprayers that could stand the corrosive action of modern petroleum based and other solutions.

The Lofstrand Sprayer meets that urgent need. It is made of stainless steel, machined brass parts and synthetic rubber hose and washers. It is precision-built, with all welded seams. The spray gun is leak-proof to prevent dripping on operator or area to be sprayed. Nozzles *(different types available to suit your needs)* atomize liquid into fine particles, so that less is required . . . and it is more penetrating.

Tank has a two gallon liquid capacity; pressure up to 60 lbs.; accurate pressure gauge. Double strainers really keep out clogging sediment. It is easy to clean; demands little care or replacement of parts.

The Lofstrand Sprayer is equal to the powerful insecticides in use today. . . . Retail price, only $29.50.

If your distributor does not carry this sprayer, send his name to us, along with yours, and you will be taken care of promptly.

"Of course it costs more . . . but it's worth more than it costs."

THE LOFSTRAND COMPANY · 956 SELIM ROAD—SILVER SPRING, MD.

NOTES ON LABORATORY METHODS

HEBER C. DONOHOE, *Research Director*; DOROTHY D. KING, *Assistant Entomologist*;
CLAIRE M. GALL, *Laboratory Aide*; WILLIAM PETERMAN, INC., *Newark, New Jersey*

SOME TIME we have been engaged in the development insect rearing and testing methods for use in the laboraf William Peterman, Inc., makers of household insecticides. of our ideas thereon may be helpful to Pest Control Operao wish to conduct research studies of their own.

rearing technique largely is a composite of methods emand developed by others. We shall attempt to give credit to r their contributions. If any are missed, it is not intentional. sting methods, on the other hand, are entirely original, h currently one of these is being used in a considerably d form, by other laboratories.

Rearing

of our colonies are maintained on escape-proof tables proll around, with a 2″ x 2″ metal trough, sunk flush with the p. Mineral oil in this trough provides a moat across which ng roaches and other crawling insects cannot pass. We do w the originator of this widely-used type of table. It has odified only through installation of a pet-cock in the floor trough for cleaning (the intake must be screened), and in each table on 16-inch legs. They can thus be stacked, one other, to reduce the laboratory space needed. Ours are in a hree outside dimensions of each 3 feet by 5 feet, and each of holding a total of 28 rearing jars.

on 1. View of laboratory battery of roach rearing tables.

esting, our main reliance is placed on American roaches our experience, these are more resistant to practically all toxicants than is the German species. Germans are used ficiently to verify this resistance. American roaches, in r, react unfavorably to a filthy habitat and reared in such onment, not only is mortality great, but also, resistance st is sharply reduced. Every effort, therefore, is made to cleanly living conditions for our colonies. On advice from an S. Henderson, Division of Insects Affecting Man and Bureau of Entomology and Plant Quarantine, Beltsville, l, that sawdust provides an odor-absorptive sub-stratum, ing observed that overcrowding in large colony jars is tal, all active stages are maintained in standard 7 x 9-inch ars on a 2-inch bed of compressed, mixed, soft and hardvdust. Resting on this is a "dispersal ladder," consisting 10″ strip of 4- or 3-meshes per-inch hardware cloth, shaped into a semi-circle with two compressions at the top, which hold the water bottles.

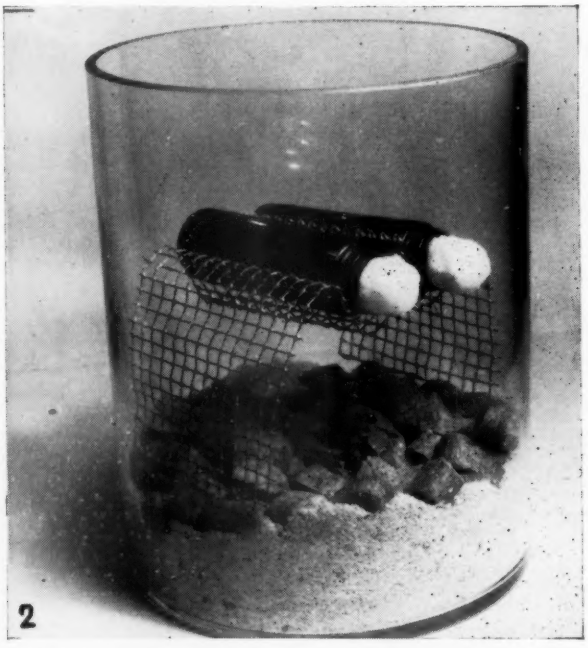

Illustration 2. Standard roach rearing jar showing dispersal ladder, water bottles. Sawdust sub-stratum, and food.

The food, consisting of dehydrated dog food meal, plus several dog food brisquettes, is scattered over the surface of the sawdust. As is the standard practice the top 2 inches of the jar's inner face is covered with a thin film of mineral oil and, both as a protection against air-borne laboratory dust particles and as a further escape-precaution, each jar is covered with cheesecloth.

Each colony receives a fresh supply of water weekly and, at monthly intervals is transferred to a clean jar. This transfer is made without the benefit of chilling to inactivate the colonies and requires considerable acquired dexterity to prevent escapes. At transfer the growing colonies are subdivided to prevent overcrowding.

Except during feeding, egg-laying and occasional digressions for other purposes, the roaches spend their time on the dispersal ladders. We regard these as most important contributors to the health and general well-being of our colonies, although reasons for this are not yet clear. Among apparent advantages, a ladder greatly increases the available surface area over which to disperse, very few metabolic by-products adhere to the screens, and the air movements through the screen quite possibly remove the toxic, volatile metabolic by-products more rapidly than if the dispersal-area-base were solid.

In our breeding stocks, at monthly transfer the egg capsules are sifted out of the sawdust and held in open crystallization dishes for hatching. Food and water are supplied, and a dispersal ladder, fashioned by pleating a strip of paper toweling, rests across the dish floor. Most of the nymphs, shortly after hatching, rest on this ladder, on the food, or water dish and are easily transferred therefrom to the battery jars. After hatching starts, transfers are made at weekly intervals. This process subsequently yields stock of fairly uniform age for testing. It should be noted, however, that considerably more attention is paid at testing to size and vigor than to age uniformity.

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Extensive field tests confirm the effectiveness of Du Pont RODENTICIDE A N when used against the Brown or Norway rat, the predominating disease-carrying species. This rodenticide is being used by professional rodent-control operators with satisfactory results.

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Du Pont RODENTICIDE A N has desirable odorless and tasteless characteristics. It is economical—lethal dose is usually less than 10 milligrams per kilogram of body weight. The lethal action is swift and certain.

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BETTER THINGS FOR BETTER LIVING
... THROUGH CHEMISTRY

We have kept no detailed life history records, but have obtained adult American roaches by the above procedure in as little as six months. The average hatching to adult period is of not more than 9 months duration. This is somewhat less than the developmental period recorded by Gould[1] and others.

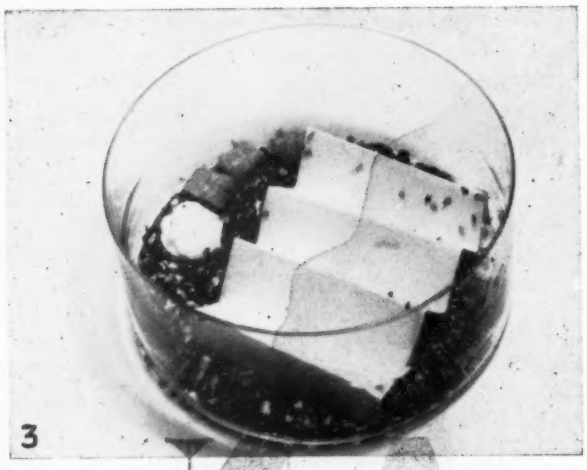

Illustration 3. Hatching dish showing paper dispersal ladder, water dish, food, egg capsules and newly hatched nymphs.

Because of current well-known supply conditions, we have had no air-conditioning facilities. As a consequence, there have been deleterious effects on our colonies both from a summer combination of high temperature and relative humidity and from low winter temperatures and relative humidity which occur as a result of week-end coal conservation.

Much to our perplexity, German roaches react so unfavorably to the above rearing technique that satisfactory colonies cannot be maintained. While other explanations still are being sought, it appears that this species lives and develops best under filthy and, perhaps, crowded conditions, and that cleanliness of living quarters is inimical to its well-being. The only other species now under study is the brown-banded roach **Supella supellectilium.** It thrives under our technique, except that it is exceedingly sensitive to low week-end temperatures.

Testing

All of our readers probably are familiar with the "settling-tower" and various so-called "walk tests" used widely in evaluating roach powders. As most often employed, neither one, in our judgment, affords a practicable means for judging the prospective value of a commercial powder. The former, through settling out from a dust-impregnated atmosphere, lays down a uniform cover over the bodies of defenseless roaches in escape-proof containers. Experienced pest control operators doubtless will agree that few situations resembling this are apt to be encountered in the field. The latter, generally consists of dumping, or, in some cases violently throwing, highly-frightened roaches onto a surface dusted with, or surrounded by an unbroken line of test powder. Quite naturally, "test" roaches, in their frantic efforts to escape, burst through a powder barrier line or rush over a dusted base in decidedly a typical fashion. In this process, the test powder is forced into the more vulnerable surface areas (such as wing bases, intersegmental membranes, spiracles and mouth-parts) and often gives fantastically-good "experimental" data which cannot be duplicated in control applications. Obviously, while foraging for food in their adopted habitats, roaches move cautiously. If a powder is to be effective as a surface application, it must be sufficiently potent to kill these cautious foragers either through their resting thereon or through the action of dust particles which adhere as the insects cross treated surfaces.

In the laboratory our objective has been to set up walk-test conditions which simulate those encountered in field situations. We have rejected the settling tower procedure, in toto, for two primary reasons:

1. While admittedly a workable screening test for new and untried chemicals, we see no connection between data from such testing and the use of a new chemical in the formulation of an effective roach powder.
2. Any substance which (directly or indirectly) kills by body contact virtually is certain to kill more readily by general dusting of an insect's entire surface area. Thus, we submit, a true "walk" test is more rigorous than any body surface dusting procedure.

As a laboratory interested mainly in the practical application of our research data, all of our comparative testing is on a powder volume basis. That is, we are interested in what the results will be when a measured quantity of powder is applied by "Mrs. Housewife." She, obviously, will use about the same amount in dusting to combat her infestation, whether the powder has a density of two or twenty cubic inches per pound. The generally-followed practice of making comparisons on a weight basis possibly is logical for preliminary screening of new and untried chemicals. Its use in evaluating powder formulations appears to be illogical.

Disc Method: (Illustrations 4 and 5). If the reader will refer to these illustrations during the subsequent explanation, the method will be more readily visualized. In this and the "flat test" described later, all plywood parts are coated with Bakelite enamel. The testing base is a circular plywood disc of 7½-inch diameter, the surface of which is scored in ½-inch concentric rings. The outer ¾-inch is masked with a plywood ring and a masking disc covers the center of the base. The channel formed by these masks becomes the powder-crossing area, and may be any desired width by varying the diameter of the central mask upward from a minimum of 2½ inches. We employ a 1½-inch wide powder band in all standard testing. Using an ordinary salt shaker, a measured volume of 6 cc. of test powder is dusted into the channel. With experience this quantity will cover it thinly and evenly to a width of 1½ inches. Next, the masks are removed, a clean paper disc replaces the central disc, and a glass stand-pipe 4 inches high and of 2-inch inside diameter is centered on it. The assembled unit is placed in a 9-inch crystallization dish. Both the inner wall of the dish and inner face of the standpipe are coated with a thin film of light mineral oil to prevent escape of test insects. With the unit assembled, either 5 well-grown American nymphs, or 10 to 15 Germans of assorted ages are placed in the standpipe. After some preliminary scurrying in attempting to escape, the roaches will settle at the base of the standpipe, resting on the paper disc. When all are quiet, the standpipe is lifted and by gentle manipulation of a small bristle brush the roaches are guided, unfrightened, across the band and off the edge of the disc to the floor of the dish. One or more will occasionally become frightened but, in general, the crossing takes place in the cautious fashion which we believe is typical of roach ambulation. After all roaches are off the disc it is removed and any particles of powder are wiped from the dish at once with absorbent cotton. Thus, particles which either are kicked off by the roaches, or fall from their bodies or legs, are removed. The dish then becomes the holding chamber for mortality observations. Food is supplied and water is added, usually daily, by sprinkling the bottom of the dish.

We have found the above disc test procedure most helpful in the preliminary evaluation of experimental finished powders and lean heavily on it for our laboratory testing.

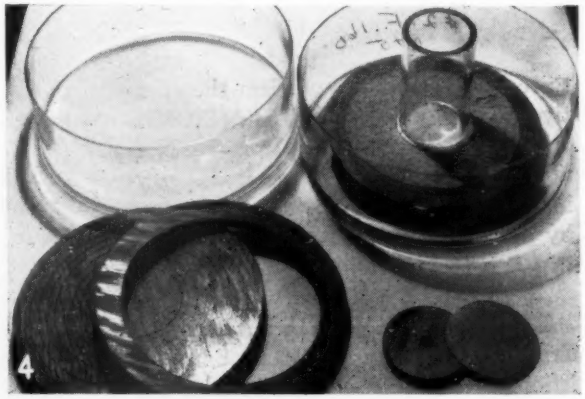

Illustration 4. Component parts of the disc method for testing roach powders.

Flat Test: The only other testing method we use with any frequency is a multiple-crossing type (illustration 6), termed by us the "flat test." The flat is a screen-sided box 3 feet square inside, with 4-inch walls and a screened lid which fits snugly into a rabbeted sill. A 35-inch square fence, 2½ inches high, rests on the floor and confines the roaches to the floor area. Otherwise they have an annoying tendency to rest for days-on-end on the screening. The fence is cut from ⅛-inch Lumarith plastic sheeting, glued

FUMIGATION NEWS

MAY *Published in the interest of Pest Control Operators and the use of*
AERO BRAND HCN DISCOIDS AND CYANOGAS
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American Cyanamid & Chemical Corporation
Kansas City 6, Mo. 30 Rockefeller Plaza, New York 20, N. Y. Azusa, Calif.
1946

THEATRE FUMIGATION PRACTICAL AND ECONOMICAL WITH HCN DISCOIDS

The need for fumigating a theatre quickly and effectively often arises. Just as often, however, Pest Control Operators are inclined to refuse such jobs because of the difficulties attending them.

Theatres must be fumigated with very little time allowed for exposure to the gas and for ventilation, since theatre operators do not like to miss a performance. The question of cost has also been a vital factor for it is not economically practical to fill an entire theatre with gas when the infestation is confined mainly to the seats. Also, the concentration of gas required to do so would present the problem of securing proper aeration in a very short time.

A simple but effective method of theatre fumigation is now being practised by a number of Pest Control Operators with highly satisfactory and profitable results. The seats are fumigated with AERO* BRAND HCN DISCOIDS under a sheet of rubberized fabric. The fumigator covers a block of the seats at a time, using a sheet approximately 40 x 40 feet. Such a sheet weighs roughly 100 pounds. The available area of the sheet is about 30 x 30 feet, since allowances must be made for the drop of the sheet from the top of the seat back to the floor, and a little over, to rest bricks or weights upon, so as to keep the sheet close against the floor and thus prevent escape of gas.

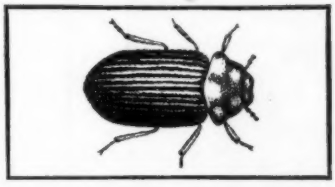
The enclosed space with the sheet so arranged would amount to approximately 2,500 to 3,000 cubic feet. The dosage generally used for such work is in the neighborhood of 12 ounces of HCN DISCOIDS per 1,000 cubic feet. Using a 40-ounce can of DISCOIDS under the sheet would be somewhat in excess of the 12-ounce dosage but the excess does no harm. On the contrary, it gives a little stronger concentration of the gas—extra assurance of a complete kill.

After a 2-hour exposure the sheet is transferred to the next block of seats, and so on, until all of the seats have been fumigated. Of course, in the case of larger theatres it would be advisable to have more than one sheet in order to expedite the work and cut down the time factor.

While there undoubtedly are several sources where suitable rubberized sheeting may be obtained for this purpose, for those who are interested in following up this opportunity immediately, we shall be glad to suggest a source of supply. Write us today.

STORED COMMODITY INSECTS

Drugstore Beetle



The drugstore beetle. *Courtesy Canadian Dept. of Agri.*

Because of its ability to attack a large variety of foods, the drugstore beetle is one of the most injurious and most difficult to combat of all insects in stored food products.

The adult beetle is about one-tenth of an inch in length and reddish brown in color. The antennae end in three large joints that form a sort of club. It is not to be mistaken for the confused flour beetle, as it is shorter and broader in proportion.

The larvae, which are small white grubs, are covered with silky hair and have three pairs of small legs. The end of the abdomen is usually bent under the body, giving the larva an arcuate appearance.

The life cycle requires about two months during warm weather. The larvae combine the characteristics of "grubs" that work within hard products, such as kernels of grain, and of those that crawl about in milled products. They are usually found within grains, macaroni, or other food material and the pupae are either in the larval burrows or in cases formed by fastening food particles together. The adults feed on the same food as the larvae.

Apparently almost any organic material may serve as food for the drugstore beetle. The list of the foods that it has been known to attack includes more than a hundred items, among them grains and grain products, drugs, peppers, spices and other plant products.

The most satisfactory kill of the general run of these insects infesting plants manufacturing, handling and storing foodstuffs and other commodities, can be made with HCN fumigation. Regular periodic fumigation with AERO BRAND HCN DISCOIDS has been found to be the best method of keeping this ever-present insect pest under control.

RAT HARBORAGES WIPED OUT WITH CYANOGAS A-DUST

CYANOGAS is easily spread wherever rats and mice might be hiding.

Now is the time for local feed granaries and seedstores, mills and warehouses to keep their rat enemies under control. Many such jobs can be found right in your community and the most successful method of doing this is with CYANOGAS**. Where material suitable for rat food is constantly stored, such places must be kept free of rats and mice to prevent loss and avoid possible spread of disease. A clean-up job is quickly accomplished with CYANOGAS G-FUMIGANT used indoors—observing usual precautionary procedure—and with CYANOGAS A-DUST in a CYANOGAS Foot Pump to destroy rodents in burrows outdoors. All rats in their burrows and hideouts indoors and out are killed instantly by one whiff of CYANOGAS. It has been found that the application of CYANOGAS gives complete relief from rats and mice at very low cost, and seed and grain may be stored for long periods without damage by rodents.

For more information on fumigation with AERO BRAND HCN DISCOIDS and CYANOGAS Calcium Cyanide, write for free manuals.

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together with cellulose acetate cement and is coated, inside, with a film of mineral oil.

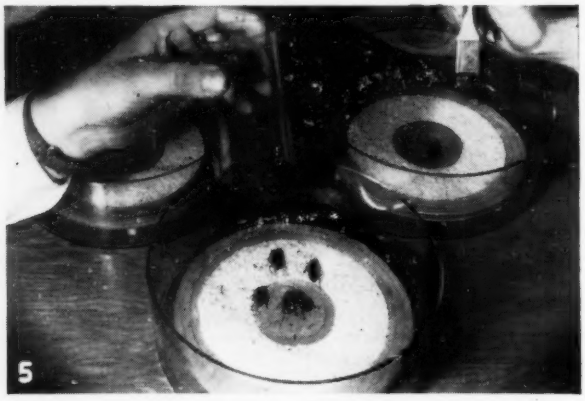

Illustration 5. Disc method showing manner of exposure of roaches to test.

A total of six cubic centimeters of test powder is shaken out in bands, approximately 1 inch wide, at chosen areas on the floor. Our present standard involves 4 six-inch-long bands located midway between the corners and projecting perpendicularly toward the center from the Lumarith fence as a base. Test roaches are confined in the center of the flat in a metal standpipe 3 inches high and 3 inches wide. A string, tied to the upper edge of the standpipe, passes through the small lid in the cover. With lid and cover in place and the roaches resting quietly, this string is pulled sufficiently to tilt the standpipe and thus leave a crack beneath one edge through which the roaches can disperse at will. During this dispersal they may make multiple crossings of the powder bands. On the other hand, if a powder is sufficiently repellant, presumably they would avoid crossing it since only about two per cent of the floor area is occupied by the bands.

Illustration 6. Flat method. Note release of test insects from central standpipe, Lumarith collar, and powder bands. Except for purposes of illustration, the lid is in place during testing and the standpipe is tilted as described in the text.

We believe the flat test somewhat approximates home conditions in which bands of powder are dusted as barrier lines in front of hiding places and across areas over which roaches forage. If properly applied, such barrier lines presumably are crossed more than once and probably many times by each domicillary roach in its peregrinations. Thus, even although a powder is not sufficiently potent to kill as a result of a single crossing, it may work out to be highly effective in practical use.

Aside from simulating what is presumed to occur under home conditions, the flat test is of principal value to us as a means for rating the speed with which powders inactivate and kill. Relatively slight differences in effectiveness can be determined and measured satisfactorily by direct comparisons. In addition, variations in season, temperature, humidity and unknown ecologic factors which appear to influence results from other test procedures have not affected flat test results.

Under no circumstances do we regard laboratory testing of experimental powders as any more than a preliminary indication of potential value. If results from laboratory evaluations of formulation by means of disc and flat tests are sufficient to continued interest, the material is subjected to exhaustive te evaluation under field conditions. This testing involves ou treatments and evaluations in dwellings and other infested in widely-divergent geographical areas and cooperative wor numerous other individuals and agencies.

Reference Cited

1. Gould, George E., The biology of six species of cockr which inhabit buildings. Bull. 451, Purdue Univ. Agric. Sta., 31 pp., Sept., 1940.

Bactericidal Lamp

Invisible bactericidal rays sprayed by a new U-shape violet lamp can reduce the bacteria count in washed milk ca per cent in one minute, the Westinghouse Lamp Division Re Laboratories reported recently.

The report was based upon tests conducted under cond of contamination more extreme than ever would be encounte normal service. Although longer irradiation brought slightly results, for practical purposes in a dairy, adequate bacteria-k efficiency is obtained in one minute. Dr. Harvey C. Rents director of the laboratories, said the tests showed that the Ster ultraviolet tube was only one per cent less efficient in 45 se of irradiation than in one minute.

Bent U-shape to get maximum radiation of all exposed ar a can, including the hard-to-reach areas in the shoulder, the 3 long lamp fits into any conventional size dairy utensil. Ope on standard 110-120 volts alternating current circuits, the consumes less electricity than a 25-watt electric light bulb.

—Calendar of Meetings—

Secretaries of Pest Control Associations, as well as others planning meetings of pest contro interest, are invited to send date and place of such meetings for listing in this column. To insure maximum publicity in advance of the meeting, such information should be sent at the earliest possible time.

National Sanitary Supply Association (23rd annual convention), May 26-29. Booths for display purposes. Leo. J. Kelly, executive secretary, 139 N. Clark St., Chicago 2, Ill.

National Association of Insecticide & Disinfectant Manufacturers, 32d annual mid-year meeting, French Lick Springs, Ind., June 17, 18 and 19.

Construction Industries Exposition and Home Show, Pan Pacific Auditorium, Los Angeles, Calif., July 12 to 21, 1946. Applications for booths may be made to D. D. Durr, c/o Tabery Corp., 3443 S. Hill Street, Los Angeles 7.

Alabama Pest Control Association, semi-annual meeting, September 14 (tentative), Admiral Semmes Hotel, Mobile, Ala. A. S. Krawcheck, Orkin Exterminating Co., Inc., 101 S. 20 Street, Birmingham 3, Ala.

National Pest Control Association (14th Annual Convention), Roosevelt Hotel, New Orleans, La., October 28, 29, 30, 1946, (Tentative).

American Public Health Association (annual meeting), Cleveland, Ohio, week of November 11, 1946. Exhibits will be featured. Willimina Rayne Walsh, Associate Secretary, 1790 Broadway, New York 19, N. Y.

National Association of Insecticide and Disinfectant Manufacturers, 33rd annual meeting, Hotel Commodore, N. Y., December 2, 3, 4 (tentative).

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Orthoptera in English Poetry and Drama: The Grasshoppers, Katydids and Crickets*

By C. R. TWINN, *Ottawa, Ontario*

THE ORTHOPTERA are, in general, rather large insects, not particularly good fliers, but with well developed powers of running and leaping. Some of the species belonging to the order are very numerous and widely distributed, and are important economically because of the damage they do to plant life in satisfying their truly enormous appetites. Prominent among these are the short-horned grasshoppers (family Acrididae) and the crickets (family Gryllidae). This order, too, includes several of the best known singers or instrumentalists in the insect world, the most accomplished of which are the long-horned grasshoppers or katydids of the family Tettigoniidae.

Family Acrididae: The Short-horned Grasshoppers

The species of grasshoppers which do most damage to crops belong to the family Acrididae, or short-horned grasshoppers, so-called because their antennae are much shorter than those of species in related families. They are also commonly referred to as locusts, especially when they assume the swarming or migrating habit. There are a number of eloquent references to locusts in the Bible, the earliest being in **Exodus** (X), wherein is described the plague of locusts inflicted upon Egypt to punish Pharaoh for his oppression of the Israelites. This account of a locust outbreak is given at some length here because of its vividness and general accuracy. Moses and Aaron brought God's message to Pharaoh to "let my people go" or:

"Else if thou refuse . . . tomorrow will I bring the locusts unto thy coast: And they shall cover the face of the earth, that one cannot be able to see the earth: And they shall eat the residue of that which is escaped, which remaineth unto you from the hail, and shall eat every three which groweth for you out of the field: And they shall fill thy houses, and the houses of all thy servants, and the houses of all the Egyptians; which neither thy fathers, nor thy fathers' fathers have seen, since the day that they were upon the earth unto this day . . . And the Lord saith unto Moses, Stretch out thy hand over the land of Egypt, for the locusts, that they may come upon the land of Egypt, and eat every herb of the land . . . And Moses stretched forth his rod . . . and when it was morning the east wind brought the locusts. And the locusts went up over all the land of Egypt, and rested in all the coasts of Egypt: very grevious were they; before them there were no such locusts as they, neither after them shall be such. For they covered the face of the whole earth, so that the land was darkened; and they did eat every herb of the land, and all the fruit of the trees . . . and there remained not any green thing . . . And the Lord turned a mighty strong west wind, which took away the locusts, and cast them into the Red Sea; there remained not one locust in all the coasts of Egypt."

The species involved in the outbreak thus graphically described was believed by Imms (3, p. 248) to have probably been the migratory, **Schistocerca gregaria** which is found in northern Africa, Persia, Afghanistan and Northern India. Outbreaks of this and other species have occurred periodically throughout the centuries, causing immense damage and privation. In 1925, there was a great outbreak of this locust in British territory in North Africa which lasted for several years, and caused damage estimated at more than thirty millions of dollars.

Milton used the plague of locusts described in Exodus to illustrate in **Paradise Lost** (Rom. 339-346) the tremendous number of "bad angels . . . hovering . . . under the cope of Hell":

"As when the potent rod of Amran's son, in Egypt's evil day,
Waved round the coast, up called a pitchy cloud
Of locusts, warping on the eastern wind,
That o'er the realm of impious Pharaoh hung
Like night, and darkened all the land of Nile:
So numberless were those bad angels seen
Hovering on wing under the cope of Hell."

In Book 12 (185) he refers directly to the plagues of Egypt:

"Hail mixed with fire must rend the Egyptian sky,
And wheel on the earth, devouring where it rolls;
What it devours not, herb, or fruit, or grain,
A darksome cloud of locusts swarming down
Must eat, and on the ground leave nothing green."

A very fine account of the approach of a swarm of locusts was given in somewhat metaphorical language by the prophet Joel (**Joel**, 2.2-10;20):

"A day of darkness and of gloominess, a day of clouds and of thick darkness, as the morning spread upon the mountains; a great people and a strong; there hath not been ever the like, neither shall be any more after it, even to the years of many generations. A fire devoureth before them, and behind them a flame burneth: the land is as the garden of Eden before them, and behind them a desolate wilderness; yea, and nothing shall escape them . . . Like the noise of chariots on the tops of mountains shall they leap, like the noise of a flame of fire that devoureth the stubble, as a strong people set in battle array. Before their face the people shall be much pained: All faces shall gather darkness. They shall run like mighty men; they shall climb the wall like men of war; and they shall march every one on his ways, and they shall not break their ranks: neither shall one thrust another; they shall walk every one in his path . . . They shall run to and fro in the city; they shall run upon the wall; they shall climb up upon the houses; they shall enter in at the windows like a thief. The earth shall quake before them, the heavens shall tremble: the sun and the moon shall be dark, and the stars shall withdraw their shining:".

Authorities agree that this is a remarkably accurate description of an army of locusts on the move. In his **Thalaba** (L. 169), the poet Southey also deals with this subject and graphically describes the noise of the grasshoppers in flight, which elsewhere has been likened to the sound of flame driven before the wind:

"Onward they came, a dark continuous cloud
Of congregated myriads numberless,
The rushing of whose wings was as the sound
Of a broad river headlong in its course
Plunged from a mountain summit, or the roar
Of a wild ocean in the autumn storm,
Shattering its billows on a shore of rocks!"

It is only in comparatively recent years that the possibility of combating or forestalling locust outbreaks has received serious study. According to Burr (2, p. 270) there were attempts in Pliny's day to control the locusts. In Cyrenaica, strict regulations were enforced for the collecting of the eggs and other life-stages of the locusts towards this end. Modern scientific research and organization is now being applied to the problem, and with the co-operation of the government and peoples concerned a solution should be found that will relieve a large section of humanity from this intermittent scourge. It is possible, in view of the tremendous areas affected, that such a solution will involve locating and studying the original breeding places of the insects, and with adequate organization and financial support taking steps to destroy incipient outbreaks at their source.

The ancient practice of eating locusts, which still persists, may be considered to some extent a control measure, as well as a means of adding proteins to the diet. The Israelites were permitted to eat locusts under Mosaic law. In **Leviticus** (XI. 21-22) the Authorized Version presents Moses' instructions to the children of Israel as follows:

". . . these of them may ye eat: the locust after its kind, and the bald locust after its kind, and the cricket after its kind, and the grasshopper after its kind."

Burr consulted several leading authorities as to the precise meaning of the original Hebrew words denoting the insects, and although there was some difference in opinion, came to the conclusion that not four different kinds of insects were meant, but the various stages in the development of the locust from the youngest nymph to the migratory form.

Many other peoples of Asia and Africa besides the Israelites consider locusts as a legitimate and enjoyable form of nourishment. It may have been one of the migratory species common to Morocco and customarily used for food that Shakespeare referred to in **"Othello"** (I. 3), when he had Iago say to Roderigo: "Fill thy purse with money, the food that to him now is as luscious as locusts."

One method of preparing these locusts for the table is to throw them into boiling, salty water, afterwards removing the head and appendages. They may then be broiled, stewed or fried in butter, then they are said to resemble shrimps or prawns.

While on the subject of locust control it is of interest to recall early efforts to deal with grasshopper outbreaks by methods of

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	Flies, ants, gnats, mosquitoes, fleas, ticks, wasps, cockroaches, carpet beetles, moths, silverfish, bedbugs, weevils, cadelle, and other stored product insects.				
	UNDER THESE CONDITIONS				
YOUR PLACE OF USE	On surfaces where *wetting* by water and *visible residue* are not objectionable.	On surfaces where *wetting* by water is not objectionable and *visible residue* is not desired.	On surfaces where *wetting* by water *is* objectionable and *visible residue* is not desired.	For large users who may wish to prepare their own spray mixtures by adding solvents.	On floors and baseboards, in cracks and crevices of woodwork, dark places behind pipes and other places insects infest.
	USE	USE	USE	USE	USE
YOUR PRODUCT	**DEENOL 50-F** Wettable powder; mix with water, use as spray. DDT—50%.	**DEENOL 25-EM** Emulsifiable oil; dilute with water, use as spray. DDT—25%.	**DEENOL 5-H** Ready-to-use oil spray. DDT—5%.	**DEENOL 25-C** Concentrated oil; dilute with a solvent, use as spray. DDT—25%.	**DEENOL 10-A** Ready-to-use dusting powder. DDT—10%.

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ecclesiastical censure. In Purchas's **Pilgrimes** (II, 1047), published in London in 1625, there is, according to Phipson (4, p. 395), an account by a Portugese priest named Sir Francis Alvarez, of how he conjured the locusts in Ethiopia in the year 1560:

"The number of these creatures," he wrote, "is as great as it is incredible, and with their multitude they cover the earth and fill the ayre in such wise that it is an hard matter to be able to see the sun . . . These vermine are as great as a great grasshopper, and have yellow wings . . . We assembled the people of the towne, and all the priests, and taking a consecrated stone and a crosse, all we Portugals sung the Letanie. I caused them to take a quantity of locusts, and make of (over) them a conjuration, which I carried with me in writing, which I had made the night before, requiring them, charging them, and excommunicating them, willing them within three houres space to begin to depart toward the sea, or toward the land of the Moores, or towards the desert mountains, and to let the Christians alone: and if they obeyed me not, I called and adjured the fowles of the heaven, the beasts of the field, and all the tempests, to scatter, destroy, and consume their bodies. And for this purpose I tooke a quantity of these locusts, and made this admonition to them which were present, in the name of themselves, and of those which were present, in the name of themselves, and of those which were absent: and so I let them goe, and gave them libertie . . . In the meanwhile, arose a great storm and thunder towards the sea, which lasted three hours, with an exceeding great shower and tempest, which filled all the rivers, and when the water ceased, it was a dreadful thing to behold the dead locusts, which we measured to be above two fathoms high upon the bankes of the rivers in such wise, that on the next morning, there was not one of them found alive upon the ground."

Another interesting item of this sort, recorded from Purchas's work by Weiss (6), which throws further light on the credulity and customs of the time, reads as follows:

"In the yeere 1603, at Fremona, great misery happened by Grassehoppers, from which Paez freed the Catholikes, by Letanies and sprinkling the Fields with Holy-water; when as the Fields of Heretikes, severed only by a Ditch were spoyled by them. Yea, a Heretike using this sacred sprinkling, preserved his corne, which to a Catholike neglecting in one Field, was lost, and preserved in another by that conjured aspersion (so neere of kinne are these Locusts to the devill, which is said to hate Holy-water)."

The true migratory locusts do not occur in the British Isles, but a dozen other species of short-horned grasshoppers are represented there, certain of which have attracted the attention of the poets from time to time. A score or more of English poets have written of the grasshopper, but most of them seem to have been more impressed with its supposedly happy life and gay song than with its destructive possibilities. An exception was Moore, who in **The Periwinkles and the Locusts** wrote:

"Of all the beasts that ever were born,
Your locust most delights in corn;
And though his body be but small,
To fatten him takes the devil and all!"

Nicholas Udall, in **Ralph Royster Doyster**, the first English comedy, used the grasshopper to point a moral, and doubtless drew his inspiration for so doing from classical sources.

"As long liveth the mery man (they say),
As doth the sory man, and longer by a day:
Yet the grasshopper for all his sommer piping
Sterveth in winter wyth hungrie gripyng."

Actually, most species of grasshoppers die in the autumn after depositing their eggs in the soil to carry the species through the winter. Keats, in his poem **On the Grasshopper and the Cricket**, illustrates the true poet's attitude towards the grasshopper, an attitude often based on a misunderstanding of the insect's activities. It reads:

"The poetry of earth is never dead;
When all the birds are faint with the hot sun,
And hide in cooling trees, a voice will run
From hedge to hedge about the new-mown mead;
That is the Grasshopper's—he takes the lead
In summer luxury,—he has never done
With his delights; for when tired out with fun
He rests at ease beneath some pleasant weed."

As a matter of fact the grasshopper lives dangerously from the egg-pod to the grave. He is continually in stern competition with his fellows for food, and is subject to the attacks of numerous enemies, including birds, parasitic flies, predacious beetles, roundworms, and fungous and bacterial diseases, not to mention man. In short, his life is not an enviable one, and although he may swing "upon the waving ear of some well-filled oaten beard," he is not "drunk every night with a delicious tear" dropped from heaven, as suggested by Richard Lovelace in the seventeenth century.

The poets have frequently mentioned the grasshopper's song, usually in words of praise, as in Shelley's **Invocation to Misery** (V):

"On the fresh grass newly mown,
Where the grasshopper doth sing
Merrily—one joyous thing
In a world of sorrowing!"

In truth, few of the common short-horned grasshoppe really musical. The noises they make are usually subdued lations produced by scraping a row of tiny teeth on the in the hind thighs against a hardened vein on each of the close wings. Only the males do this; the females are noiseles highest development in musical attainment among the inse been reached by certain of the related long-horned grassh or katydids, which sing by night as well as by day. The c also excel the common grasshoppers, and so do the cicadas belong to an entirely different order, the Hemiptera. Ben thanks probably to the misconceptions of his classical a ties, confuses the grasshopper with the cicada in his pl **Poetaster** (V), when he refers to anry wasps or hornets buzz madly about his nostrils "and like so many screaming hoppers held by the wings, fill every ear with noise." A hopper when held by the wings cannot buzz, but a cicada, has a drum-like tympanum in its abdomen, can.

Thomas Hood was more or less right when he wrote o

"The tender grasshopper . . .
That all the summer, with a tuneful wing,
Makes merry chirrupings in its grassy nest,"

but he, too, missed the mark when he added that the inse "inspirited with dew to leap and sing." This, also, is the re confusing the grasshopper with the cicada, the latter of whi beak-like mouthparts and was believed by the ancients to on dew, whereas the grasshopper has chewing mouthpart tears and masticates its food.

Pope, in **The Iliad of Homer** (III, 199), likened seni men to grasshoppers:

"Chiefs who no more in bloody fights engage,
But wise through time, and narrative with age,
In summer days like grasshoppers rejoice,—
A bloodless race, that send a feeble voice."

However, like other insects, grasshoppers are not blo although their blood lacks red corpuscles, and is colorless o yellow or greenish. According to mythology, the grasshoppe resents Tithonius, who received the gift of eternal life fro fair Eos, without the equally desirable gift of eternal Tennyson refutes this libel on the grasshopper in the foll lines:

"No Tithon thou as poets feign
(Shame fall on 'em, they are deaf and blind),
But an insect lithe and strong,
Bowing the seeded summerflowers.
Prove their falsehood and thy quarrel,
Vaulting on thine airy feet.
Clap thy shielded sides and carol,
Carol clearly, chirrup sweet
Thou art a mailed warrier in youth and
Strength complete;".

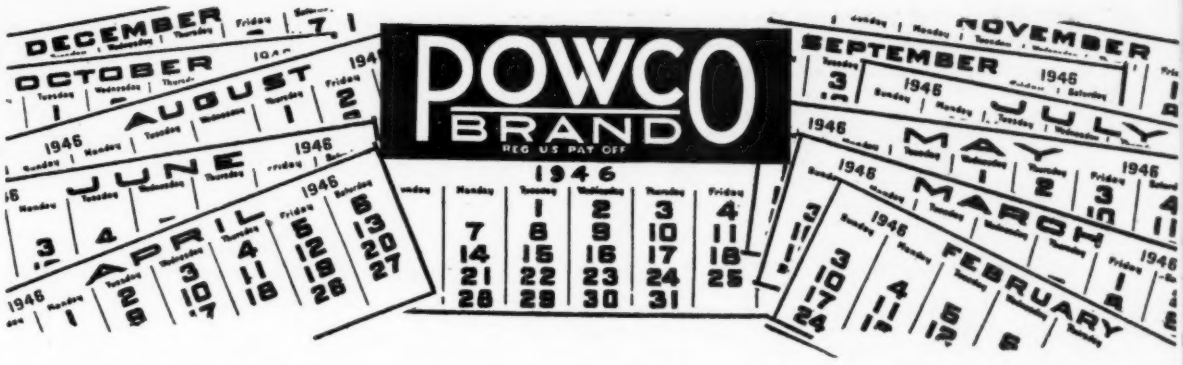
Family Tettigoniidae: The Long-horned Grasshoppers or Kat

In **Caliban Upon Setebos**, Robert Browning put in Cali head the thought that if he had wings he could:

"Fly to yon rock-top, nip me off the horns
Of grigs high up that make the merry din
Saucy through their veined wings,".

The "grigs" referred to may have been long-horned gras pers or katydids. The character which most obviously distingu these insects from the ordinary field grasshoppers is the greater length of the feelers or antennae. Further, they usually bright green in color and commonly live in shrubs trees.

The katydids are among the most accomplished of i musicians, especially the true kaytdid, **Pterophylla camelli** which is well known to the people of the United States but i found in Europe, although other species occur there. Snodgras published a very charming and instructive paper on these other musicians of the insect world. The musical instrument o katydids is situated on the bases of the front wings of the males: the females, of course, are silent. This consists, in the wing, of a thin membrane, termed the tympanum, strengthene veins, one of which is thickened and serrated like a file. The difference in the right wing is that the basal angle bears a ridge. The wings of the katydids are always folded with the overlapping the right so that the file lies above the ridge. when the wings are moved sideways the file scrapes on the



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and serves as a musical instrument, the tone and volume probably depending on the vibration of the tympana.

The long-horned grasshoppers are nocturnal, the males singing at night instead of during the daytime, as is the habit of the short-horned species. It was doubtless to one of the former that Byron referred in the following lines from **Childe Harold** (814):

"It is the hush of night . . . on the ear
Drops the light drip of the suspended oar,
Or chirps the grasshopper one goodnight carol more.
He is an evening reveller, who makes
His life an infancy and sings his fill."

An interesting fact about these insects is that the organs which are supposed to be their "ears" consist of two vertical slits in each front tibia. In the short-horned grasshoppers on the other hand, the "ears" consist of a tympanum stretched across a cavity on each side of the first segment of the abdomen.

Buckton (1) records that in northern Italy the peasants are found of the katydid and believe that it confers on them wisdom and culture. The species concerned is a beautiful insect with leaf-like wings, which they call the "Cavelletta." When a mother finds a Cavelletta in the room of a sleeping child she catches it and gently ties it by one leg to the bed-post by means of a long thread, and intones verses, translated by C. G. Leland as follows:

"O Katydid, as good as fair,
Who brings good fortune everywhere;
Since now into this house you've come,
O bring good fortune to my home,
Unto me and everyone,
But most of all unto my son!
Bring it unto me, I pray!
Do not take the least away.
In life you were a lady, full
Of talent, good and beautiful;
Let me pray, as this is true,
You'll give my child some talent, too;
And when you fly from East to West
May you in turn be truly blest.
For though an insect form you wear,
You're still a spirit good and fair."

Family Gryllidae: The Crickets

The cricket family is closely related to the family of long-horned grasshoppers already discussed. They differ from the latter chiefly in having three, instead of four, joints in their tarsi (feet), and in the position of the upper wings when at rest, which instead of sloping obliquely, lie flat and have the outer edges turned down over the sides of the body. The stridulating instruments and the "ears" of the cricket are similar in location and function to those described for the katydid.

The cricket is featured in English poetry largely because its chirruping is popularly associated with the comforts of hearth and home. This is clearly indicated in Milton's well-known lines in **Il Penseroso:**

"Where glowing embers in the room
Teach light to counterfeit a gloom;
Far from all resort of mirth
Save the cricket on the hearth,
Or the bellman's drowsy charm,
To bless the doors from nightly harm:"

And also in Tennyson's **Death of the Old Year:**

"The shadows flicker to and fro:
The cricket chirps: the lights burn low:
'Tis nearly twelve o'clock."

The species concerned here is the favorite cricket of English poets, namely, the pale brown or straw-colored house cricket, **Gryllus domesticus** L., which is widespread in Europe and parts of North America. This species likes warm situations, such as cracks and crevices in walls and brickwork close to the fireplaces, as noticed by Oliver Goldsmith in the **Vicar of Wakefield:**

"The cricket chirrups on the hearth;
The crackling fagot flies.";

and chimneys and ovens, as recorded by Shakespeare in **Periciles** (Act III):

". . . crickets sing at the oven's mouth,
Aye the blither for their drouth;"

and for this reason they often become numerous in bakeries, kitchens and basements.

The association of the house cricket with heat and dryness reminds humans of the discomforts of thirst and is responsible for the saying, "I am as dry as a cricket." Tennyson used this expression in the **Voyage of Maeldune,** line 50, which reads: ". . . *each was as dry as a cricket with thirst in the middle day heat.*"

There is considerable difference of opinion as to the quality of the cricket's song. To Keats it was full of poetic significance, and during the winter cold reminded him of the grasshopper in the summer hills, as expressed in his sonnet on **The Grasshopper and the Cricket:**

The poetry of earth is ceasing never;
On a lone winter evening, when the frost
Has wrought a silence, from the stove there shrills
The Cricket's song, in warmth increasing ever,
And seems, to one in drowsiness half lost,
The Grasshopper's among some grassy hills."

To others the cricket's stridulations are a cheerful sound. In Shakespeare's **Part I, Henry IV** (II. 4), at the Boar's Head Tavern, Poins answers Prince Hal's query, "Shall we be merry?" by saying, "As merry as crickets." Cowper refers to the house cricket as: "Little inmate, full of mirth, always harbinger of good, paying for thy warm retreat with a song more soft and sweet."

On the other hand, many people find the nocturnal chirruping of the house cricket very monotonous and annoying, and their exasperation is frequently increased by their inability to locate the whereabouts of the little instrumentalist who is very nimble and elusive. Surprisingly, perhaps, the poets were immune to such reactions: in any event they did not record them. Shakespeare and Browning, however, employed the cricket to create a tense or uncanny atmosphere. In **MacBeth** (II. 2), after murdering King Duncan, MacBeth asked Lady MacBeth if she heard aught and she replied: "I heard the owl's scream and the cricket's cry." Browning, in **A Toccata of Galuppi's** (XII), likened Galuppi's old Venetian music to "a ghostly cricket:"

"In you come with your cold music till I creep thro' every nerve.
Yes, you, like a ghostly cricket, creaking where a house was burned:".

That the cricket's song is largely a nocturnal one was recognized by Shakespeare, in **Cymbeline** (II. 2). Iachimo looks into the room where Imogen lies sleeping and says: "The crickets sing, and man's o'er-labour'd sense repairs itself by rest." Crickets, of course, have a sense of hearing, as one quickly learns if one attempts to find their hiding places by tracking down the sound. Shakespeare was doubtless aware of this, although it is improbable he knew that the cricket's "ears" are located in the tibiae or shins of the front legs. In **Winter's Tale** (II. 1), when Hermione dares young Mamillius to fright her with a tale of goblins, he says: "I will tell it softly; yon crickets shall not hear me." Browning, too, in **Saul** (VI), tells of David entering King Saul's tent and playing on his harp a "tune what makes the crickets elate till for boldness they fight one another;".

Snodgrass (5) records keeping two vigorous males of a related species in a cage with several females. The two males showed great rivalry in their stridulations, each trying desperately to out-fiddle the other. They even jostled and threatened each other with open jaws, but did no actual bodily harm. Crickets are omnivorous, however, and will readily devour the corpses of their fellows, and doubtless also the still living bodies of the feeble or dying.

In warm weather, house crickets frequently establish themselves outdoors where there is a good food supply, such as in refuse dumps. They may also be found in more attractive places as, for instance, in the garden near Wurzburg described by Browning's character, Paracelsus, in the poem of that name, as:

". . . this kingdom, limited
Alone by one old populous green wall
Tenanted by the ever-busy flies,
Gray crickets and shy lizards and quick spiders,
* * *
"Fancy the crickets, each one in his house,
Looking out, wondering at the world."

Herrick, Shelley and Tennyson also referred in their poems to a different though related species. This is the common black field cricket of the Britisn Isles, **Gryllus campestris.** Like its domesticated relative it is fond of warmth but, nevertheless, may be heard chirruping at all hours and in all weathers during summer and autumn. This was the species that served in the insect orchestra which entertained the fairy elves at King Oberon's feast, as described by Herrick in his **Hesperides:**

". . . the chirring grasshopper,
The merry cricket, puling fly,
The piping gnat for minstrelsy:".

It was probably also the species that Shelley meant in **The Boat on the Serchio,** when he said that "the crickets were still in the meadow and hill" when day awakened. It was certainly this species

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s referred to in Tennyson's **Lancelot and Elaine** by Lancelot, e said reproachfully to Guinevere:

"My Queen, that summer, when ye loved me first,
Then of the crowd ye took no more account
Than of the myriad cricket of the mead,
When its own voice clings to each blade of grass,
And every voice is nothing."

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tion No. 2405, Division of Entomology, Science Service, Department ılture, Ottawa, Canada.

·migation and Recondi- tioning Process For Damaged Foodstuffs

JAMIN STADHOLZ, ***President, Industrial Fumigation Co., Inc., and*** **GEORGE W. JARMAN, JR.,** ***President, Products Separating Corp.***

CT CONTROL measures in any food processing plant must ındertaken after a basic study has been made of the condi- ich resulted in the necessity for such measures, which · means that there has already been damage done to the ınished merchandise.

:ts do not appear spontaneously. Insect life does appear ·llowing circumstances:

ı search of food.

ı search for a place to lay eggs.

s a result of being mechanically carried in in some material hich has met one or both of the above requirements of the ısect.

·mitting vigilance is the surest means of controlling the factors. Volumes have been written on the importance iness in food plants. Any food scraps, dust, or other ›articles which lay undisturbed for over 24 hours in a ere the temperature has averaged 60° Fahrenheit may source of infestation which could result in the necessity ilding cleanup or fumigation costing hundreds, if not s of dollars.

third factor is one which is always likely to be over- Preliminary fumigation of incoming materials is the form of insurance against insect damage. The statement: · never had any trouble from that source before so why · money" is as foolish as the statement "We have never e here so why carry fire insurance." No good business makes the latter statement but thousands of business firms are in essence making and practicing the former .. They have not stopped to calculate what is actually d out in the form of spoiled goods, adjustments, shut- · emergency cleanups or fumigations, etc.

· are several ways of taking care of this third form of Careful examination on arrival and immediate rejection infested materials is the first. Fumigation as a routine of all materials which can be a source of insect life is This can be effected in various ways, such as:

ımigating the materials in the freight cars in which they

aintaining a special airtight fumigation room or section ncoming materials are placed on arrival for fumigation. ·uting incoming materials to a commercial fumigating ›re receiving them at the plant or warehouse.

·n methods of gas fumigation are highly effective, cost little and when properly used by experienced personnel have no effect whatsoever on materials treated and leave no trace of such fumigation.

Certain materials, such as corn meal, nut meats, dried fruits, and many others, must be carefully watched if they are kept on hand for extended periods as foraging insects are naturally attracted to them. Periodic inspections should be made by one who is qualified to detect the early stages of insect activity so as to prevent the certain spoilage which will ensue if the conditions are not corrected. Periodic space fumigation in buildings which are suited to such operations has been found effective.

The fullest possible protection of merchandise and trade mark goods will come from vacuum fumigation of the final product. This is the surest means of getting the package into the hands of the consumer in perfect condition even after the lapse of weeks or months. Using this method it is possible to make up perishable foods in advance of the selling season and to carry warehouse stocks against sudden demand without running the risk of such storage resulting in large losses due to insect damage, as has occurred so frequently in the past. Cold storage retards insect activity but does not eliminate it.

Another point which must be kept in mind is the tightening restrictions of the Food and Drug Administration after V-J Day. It is no longer possible to make a casual inspection of foodstuffs and assume from visual observation that all is well. Inspections of these materials are now referred to the laboratory. The test tube, microscope, and other methods of inspection may reveal objectionable foreign matter in the form of insect fragments, insect excreta and other unpleasant materials which in some cases cannot be removed, resulting in the destruction of the goods. True, there are many ways of reconditioning such materials but an ounce of prevention is still worth a pound of cure—and costs much less.

The reconditioning of foodstuffs generally occurs after the Food and Drug Administration or the local health authorities have detained such merchandise for any one of a variety of causes, but the detention always has what might be known as a "shotgun clause" which will include anything objectionable. The problem then is to put such foodstuffs back into a condition which makes them fit for human consumption after they have passed the rigorous tests of the Food and Drug Administration's laboratory.

Truly, it is not pleasant to contemplate the many things that can happen when insects, rodents and generally dirty and unsanitary conditions have one or all combined to cause such a detention. A partial list of those materials which can be detained include nut meats, grains, dried peas or beans, spices and condiments of all kinds. We are referring here to the raw materials which are dried and omitting manufactured materials or such semi-sticky masses as figs, dates, etc.

In almost all instances fumigation is necessary, but fumigation alone will not do the reconditioning because the objectionable material must be removed. The days are long past when a universal catch-all machine would process anything for any kind of detention. The product must be examined both visually and in the laboratory before any decision can be made as to whether reconditioning can even be attempted. The number of operations which them can be brought into play consists of a long list of processes, several of which may of necessity be required. There might be screening, aspirating, sizing, brushing, separating by differences in electric conductivity, cutting into smaller pieces, scrubbing, polishing, as well as hand-picking for visual differentiations.

In general it can be said that foodstuffs which are granular—that is to say, coarser than powder form—up to the size of brazil nuts can be mechanically handled in tonnage to remove rocks, brass, glass, broken and worm-eaten grains, leaf, stem, moldy particles, insect or rodent excreta, as well as fragments of insects and their webbing, at a cost which renders such reconditioning possible.

There are many well-known methods of separating such materials, such as brushing and screening or using air tables. The Food and Drug authorities have most rigorous standards so that when they do pass a reconditioned lot one can be assured that it is in perfect shape for human consumption. Reconditioning, however, always shows a loss of material and this material must be destroyed under Food and Drug supervision. It is easy to see, therefore, how necessary it is to keep constant guard against any material damage occurring through insects or rodents.

The responsibility for the condition of merchandise should be delegated to one official and he should be given sufficient authority to maintain actual control. He need not be a sanitation engineer but he must have sufficient executive ability to realize his responsibility in this matter which can mean such great loss to his company in the event his job is not conscientiously handled. Let us repeat again the fact that an ounce of prevention is still worth a pound of cure, and costs much less.

—Reprint from Food Material and Equipment, Feb. 1946.

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REPELLENTS VS POISONS

By CHARLES V. SPARHAWK, *Sparkill, New York*

SOME PUBLIC HEALTH SERVICES are reported "HANDS DOWN" on Repellents! They say they are not interested in Pallitives. In their estimation their value is only temporary. They are only concerned with Poisons. It is their contention Pest Control is a waste of time and claim it is money thrown away, because it does not kill.

They draw a distinction, however, between PEST CONTROL as it applies to Repellency and actual Pest Eradication. Would these same people assert fences are of no value? Don't they approve of gates? Both of these are REPELLENTS, devised by man to control animals. Stone walls and concrete foundations are also Repellents against rodents.

How about whips? They do not kill—in fact the sound of a cracking whip is more often employed than trying to strike an animal. According to these PUBLIC HEALTH BUREAUS they would recommend shooting stampeding cattle, while in the meantime "The Thundering Herd" drove over them trampling them to death! Our Western cowboys shoot off their pistols only to frighten and control, not to kill!

To visualize the attitude of these persons, we would paint a picture of the Health Departments in a leaking boat, bailing furiously, while the open seams through which water is pouring are ignored. Is it not more logical to seal the open gaps first to keep their craft from becoming swamped? Let's take Pest Houses for Contagious Diseases and the many Orphan Asylums and Children's Hospitals. Would not Repellents have a value in such Institutions for keeping out rats and disease bearing intruders? What Hospital would spurn the use of wire screens at the windows to keep away flies, mosquitoes and other infection and bacteria carriers. Where's the difference between rats and insects, if they bring death and disease?

Consider for a moment Vaccines and Antitoxins! Before these were discovered and vaccination perfected,Diphtheria and Small pox were rampant and millions of people died of Cholera and the Plagues. No one **killed** the **germs and bacteria** that created these terrible scourges—but REPELLENTS **put a stop to them. They died of their own inability to exist.** When rats cannot get to food and water, they starve to death. Repellents likewise SNUFFED OUT the parasites mentioned above that were creating deadly

Reppelllants

MOUSE "BOO!"

diseases They died of starvation; because their every move was checkmated—and when they sought a spot in the internal organs of human beings, they found the ANTIBODIES prepared to deliver the knock-out punch.

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● The quality, reliability, and performance of D & O Pyrethrum Extracts are too well known to past and present users and to those familiar with our record of achievement in the military aerosol program to require comment. It will be a matter of interest that our stocks of flowers and our production capacity are such as to insure our ability to make prompt shipments on any desired amounts of

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● While there have been numerous unfounded rumors as to possible price changes, both up and down, we feel that no cause for uneasiness exists. It appears certain that stocks for 1946 uses are available and adequate and that no appreciable price changes are likely to occur for some time to come.

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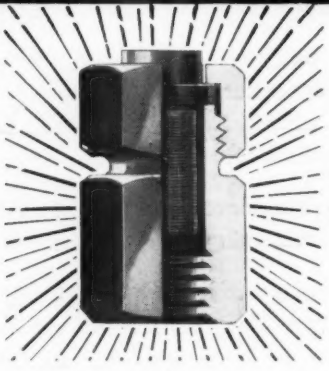

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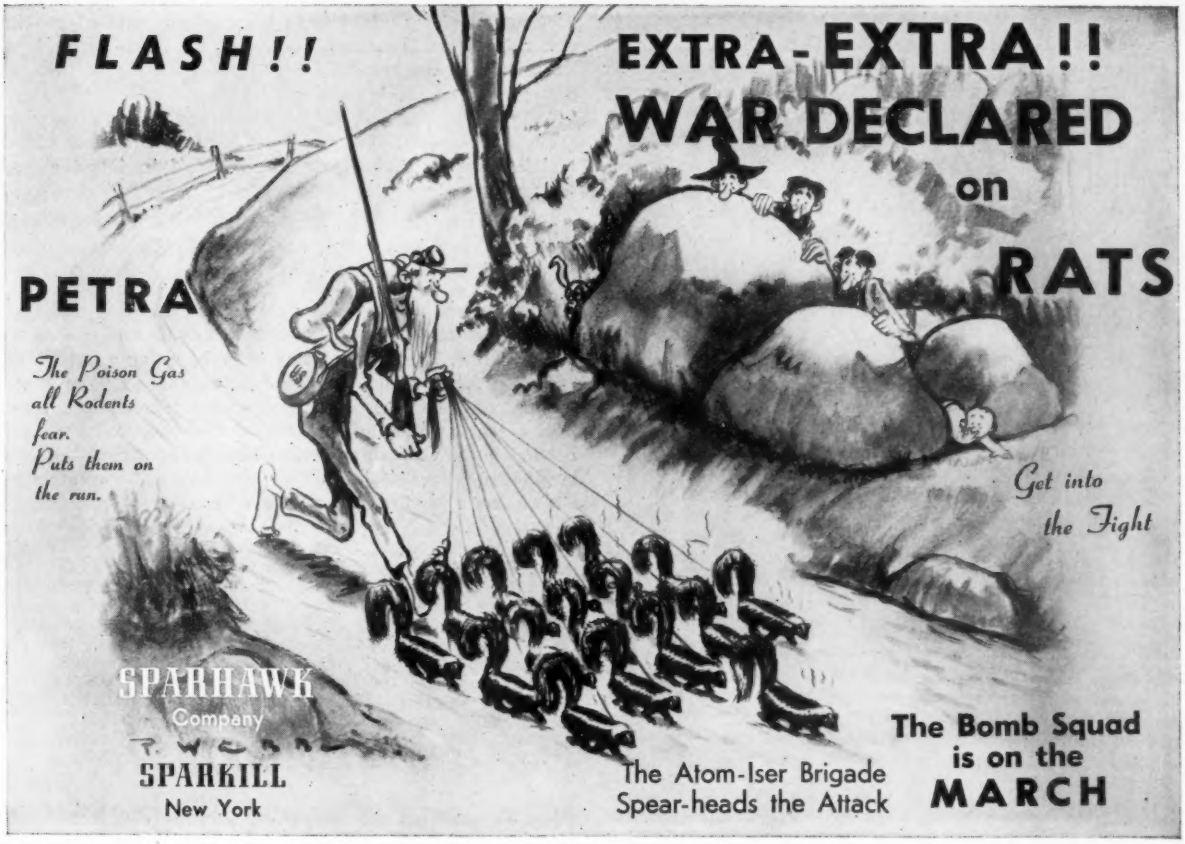
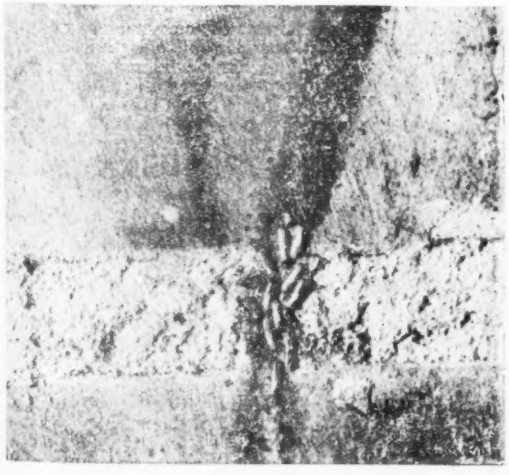


TERMITES DID THIS

Wood honey-combed by termites. View beneath exterior surface, revealing inner tunneling along the grain.

Portion of shelter tube removed, exposing termites within the walls.



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A still better example is the great Romance of the conquest of Yellow Fever. The Army Medical Corps realized the uselessness of endeavoring to KILL all the mosquitoes that proved on human guinea pags to be the carriers of the disease. The jungles and large areas of marsh land made destruction of these insect pests impossible. Once they identified the cause, they stopped the LIFE SPAN of the larvae by covering the surface of the water with "A REPELLENT" (OIL). This performed like a fence—to keep the wrigglers from reaching the air—and made it impossible for the flying insect to reach the human epidermis. Fly swatters, nets and poisons were futile amongst the heavy vegetation of the tropics. But this REPELLENT did the work and the results have proven it stamped out the virulent poison of Yellow Fever, by eradicating with a permanent Repellent its very existence.

Poison like DDT and similar deadly lethal chemicals is only efficient providing the animal eats it or it is brought in contact with its body. Trappers of fur-bearers know the problem is to **bring the victim** to the location where the traps are placed or find the spot where the animal will pass. One is going to have difficulty pushing DDT and other killing agents down rat holes and through the underground passageways where these vermin live in order to induce them to eat it. Hunters of fur employ baits and lures to get the quarry within striking range, knowing that is vital for success.

Anyone who has observed a spider closely will note he strings his gauze-like net where instinct teaches him his victims will pass. It is usually where there is a draft of wind or outside a lighted window where a moth or flying inspect will be attracted. Then the spider hides and waits the delicate vibrations that indicate his meal has come. The repellent he uses does not kill, but the "POISON" that does **is carried** to the captured prey, not swallowed voluntarily.

Even with the poisons available today, how are the exterminators going to reach the rodents behind partitions and under flooring and dark cellars? They have tried baits, but the rats multiply and the colonies are rapidly spreading over the earth. The other method is to "Scare them from their hide-outs", employing repellents the rodents will carry themselves to their own kind, frightening them with scents they recognize as their known enemy. Why do you suppose deer and other wild animals are rarely seen by persons passing through woods and open country? Even paddling in a canoe at night—when all sound is muffled by the rippling water, we hear deer crashing through underbrush and dashing widly into the blackness of the forest. Is this sight —**or is it scent?** Sportsmen know if they are to windward of a lake or pond where moose are accustomed to feed, as they approach the spot there are still fresh signs of torn lily pads and muddy water to show the human odor has been detected before sight or sound has been heard. The reaction is as clear and distinct as though some special form of RADAR were functioning to indicate the location of danger.

Rats similarly know when there are cats about or a ferret in a building. They know it as well as they do there is cheese or food. "Rats desert a sinking ship" is because they perceive water seepage and know the vessel is not a safe habitation. We all know the power of propaganda, influence of the press and the force of public opinion. They have been employed to guide human behavior and have been the creative force behind the destiny of nations. Are animals governed by the same forces? We believe so. The horse and dog accepted man's mastery. The rat and fox never have. Killing individual rats would not be as valuable as would something to make the rat avoid the residence of man—as does the fox. In place of rodents being bold and a vicious enemy of man, even attacking babies and small children in their beds, we might have them like a race of rabbits. How can this be accomplished? Perhaps by inoculation. We believe the skunk liquid applied to the fur and body of rats raises an antagonistic atmosphere, which causes the killing of many rodents by their own kind, as do the black and brown rats fight when brought in contact. At any rate it creates the feeling of insecurity and fear, driving them from their hidden lairs into the open where killing agents may be employed.

To be successful in handling any wild animal problem, one must be able to understand and **speak their language.** And it may be quite different from what the uninitiated imagine.

There was a certain moving picture company shooting a film where three feminine members of the cast looked and were dressed exactly alike. The question was to make a dog approach and show affection for just one of these girls—ignoring the others. The wise Director had the chosen girl wash her hands in **a concentrated beef extract,** while the others used their regular perfume. Without hesitation the canine actor chose the odor that spoke his preference for fragrance, while the other two got absolutely no notice whatsoever. Similarly the writer for some years has made a repellent for deer. It's to keep them away from orchards and truck gardens, where their presence is a serious menace. Previously moth balls, tinkling glass and chemicals such as creosote and tar preparations had been employed. But the concoction that seemed to accomplish the object perfectly was a mixture of wolf gland extract mixed with dehydrated red corpuscle animal blood! The deer smelled the wolf and the odor of fresh blood and cleared out of the section entirely, never reappearing so long as this frightening SCENT remained. IT SPOKE THE DEER LANGUAGE IN NO UNCERTAIN TERMS. IT SHOUTED "MURDER! MURDER!"

The Excretion of DDT (2,2-Bis-(P-Chlorophenyl)-1,1,1-Trichloroethane) in Man, Together with Clinical Observations

By **P. A. NEAL,** *Medical Director*; **T. R. SWEENEY,** *Associate Chemist*; **S. S. SPICER,** *Senior Assistant Surgeon, and* **W. F. VON OETTINGEN,** *Principal Industrial Toxicologist, United States Public Health Service*

It was shown by White and Sweeney (1) that following oral administration of DDT in olive oil to rabbits DDT was partly excreted with the urine as di-(p-chlorophenyl)-acetic acid (DDA). So far there is no evidence that the same holds true for humans. Because of the clinical and forensic importance of this question for the detection of DDT poisoning, the excretion of DDT was studied in one human subject and at the same time a clinical study was made to detect any possible toxic symptoms.

Summary and Conclusions

This experiment shows that the ingestion of 11 mg. per kg. of body weight of DDT dissolved in olive oil, corresponding to a total dose of 770 mg., did not cause detectable toxic effects in one normal individual. This experiment shows further that, as in rabbits, part of the DDT ingested is metabolized to di-(p-chlorophenyl)-acetic acid (DDA) and excreted with the urine. Under the conditions of this experiment the maximal excretion of this metabolite occurred on the second day; it decreased rapidly on the third and fourth days, and diminished gradually during the subsequent 10 days.

—*Public Health Reports, Vol.* 61, *March* 22, 1946, *No.* 12.

Group picture of those in attendance at the state meeting, sponsored by the Alabama State Pest Control Association, and held at Montgomery, Alabama, on Saturday, March 9, 1946.

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500 LBS.	35c per lb.
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TON LOTS	14c per lb.
500 LBS.	145c per lb.
100 LBS.	16c per lb.
50 lbs.	20c per lb.

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Additional Patents Relating to Pest Control

By DR. R. C. ROARK.

2,392,961 (Jan. 15, 1946; appl. Mar. 7, 1945). INSECTICIDES. Charles F. Woodward, Abington, and Florence B. Talley, Philadelphia, Pa., and Elmer L. Mayer, Sanford, Fla., and Ernest G. Beinhart, Philadelphia, Pa.—United States of America as represented by the Secretary of Agriculture.—An insecticidal composition comprises 2,2-bis(p-chlorophenyl) 1,1,1-trichloroethane and a nicotine compound as its essential active ingredients.

2,392,987 (Jan. 15, 1946; appl. Feb. 13, 1942). PRESERVATIVE COMPOSITION. Eugene Farrell Hill, Grosse Ile, Mich.—Wyandotte Chemicals Corporation, Wyandotte, Mich.—A preservative composition for preventing sap stain and mold growth in green wood comprises a mixture of sodium pentachlorphenate present in the amount of 20 to 40% by weight, of borax present in the amount of 20 to 50% by weight and modified soda present in the amount of 30 to 50% by weight.

2,393,746 (Jan. 29, 1946; appl. September 12, 1944). RE-ARRANGED ENDOMETHYLENE - HEXAHYDRO - FLUORENE ISOTHIOCYANATE. Herman A. Bruson and Thomas W. Riener, Philadelphia, Na.—Rohm & Haas Company, Philadelphia, Pa. The patentee claims as a new compound, an addition-rearrangement product of thiocyanic acid and 1,4-endomethylene tetrahydro-^{2}-fluorene, said product being an isothiocyanate boiling when pure at 178-182° C./2 mm. The re-arranged indano endoethylene cyclopentanyl isothiocyanate is a potent insecticide against flies and mosquitoes.

2,393,925 (Jan. 29, 1946; appl. Jan. 26, 1943). INSECTICIDES. Rupert C. Morris and Edward C. Shokal, Oakland, Calif., and William S. Thornhill, Plainfield, N. J.—Shell Development Company, San Francisco.—An insecticidal composition comprises a carrier and an organic ether of 3-hydroxy sulolane. The cyclic sulfone derivatives may be used either alone or in combination with other insecticides, fungicides, herbicides, rodenticides, or bactericides. Thus, for example, they may be combined with pyrethrum, derris resins, rotenone, nicotine, etc. A synergistic effect is obtained with many of these combinations, such as, for example, with cyclic sulfone ethers and ether thiocyanates.

Pest Control in Palestine

Dr. W. Beijus, writer of the following report, sent at our suggestion, is a chemist and PCO located in Tel-Aviv. He recently became a member of the N.P.C.A.

In reporting on "Pest Control in Palestine," I shall not go into details on the control of agricultural insects. There are some agricultural research stations over here which are particularly dealing in this matter, are working out new processes, are examining new products brought to the market, and which are regularly advising all branches of agriculture. The practical use of the means is being carried out by the farmer himself, nearly in all cases, and there are only a few possibilities for the Pest Control Operator to interfere. For exterminating grain-weevil and other calandra species in stored cereals some years ago a mixture of 80% Carbontetrachloride and 20% Carbondisulphide had been introduced. Experiments undertaken later on had shown very good results with Ethylene-Dibromide. The use was made by the farmers or by the Collective Settlements, since no expert is needed for the purpose. An exception represents the fumigation of citrus plantations with Hydrocyanic Acid which is being carried out by special fumigation groups.

The extermination of house insects was particularly characterized up until now by the use of HCN. There are no special regulations in Palestine restricting the use of HCN, and for the same reason a total evacuation of a partly fumigated building is not prescribed by law. However, the local type of building does not make necessary such precaution. As all room ceilings are concrete cast here, and no stoves are available, no considerable quantities of gas can penetrate into other adjoining rooms, besides the slow diffusion through the walls can be regulated by a good ventilation. Generally, the Pot-Method with Sodium Cyanide and Sulphuric Acid is being employed here. The use of more modern methods for development of HCN was impossible up until now for economic reasons, because the costs of fumigation would have been increased to a great extent, but no corresponding higher price can be obtained for fumigation.

(Such fumigation procedures would be dangerous in the United States—Ed.)

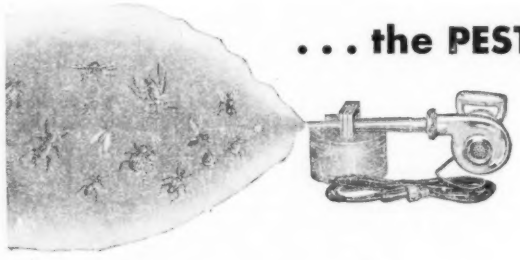
The fumigation of industrial enterprises and warehouses is being carried out on a relatively small scale. Many of the objects to which fumigation should apply are, due to the hot climate, built in such a manner that sealing is either fully impossible or far too expensive. Also, in most cases, people concerned are not sufficiently insect-conscious to undergo the expenditure of fumigation of their industrial enterprise.

An important part of Pest Control in Palestine, with which also Government and Municipal Agencies are dealing, is the extermination of rats. In the harbour towns of Haifa, Tel-Avid and Jaffa there are sometimes cases of Bubonic Plague, and recently even some cases of Pneumonic Plague. Three years ago, more than 50 cases of Plague were registered within a period of a few weeks in the twin towns of Jalla and Tel-Aviv, and the authorities undertook extraordinary measures. The harbor towns were declared by the Government as plague-infested areas, complete quarters consisting of barracks were destroyed, barracks, in which rats infected with plague were found, were burnt, and special care taken that waste and rags accumulated in the yards be removed. A big part of the population, particularly people living in the vicinity of buildings in which cases of plague occurred, received anti-plague injections, free of charge. The measures taken by the authorities were and are still restricted to mechanical methods, while the use of poisoned baits and fumigation processes are left to the Pest Control Operator.

Two species of rats exist in this country, Rattus Norwegicus, and the smaller one, Rattus rattus alexandrinus. As to insect pests, the extermination of which is serviced by the Pest Control Operator, we should mention, besides bed bugs, particularly the German cockroach, the Periplanta-species, Silverfish, Ants, Clothes Moths, Anthrenus—and Attagenus species, as well as a series of foodstuff pests.

During recent years the work was greatly hampered by an almost complete civilian lack of such important materials as: thallium sulphate and pyrethrum powder. DDT was being used up till now mainly for military purposes and for the extermination of Anopheles, as malaria exists in certain areas of Palestine. The use of DDT against other insect pests is in the initial stage and it cannot be determined yet whether its introduction, along with that of "666," will lead to increased or decreased activity on the part of the PCO.

1-29-46.



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The MISTMASTER Sprayer shoots liquid a distance of up to twenty feet, thus demonstrating its powerful, effective action. It sprays any liquid insecticide, and especially DDT. Equipped with 3/5 to 1 h.p. universal G.E. motor. One-gallon spray tank. Weight, 7 to 14 lbs.

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The efficiency of VELSICOL 1068 can be judged from the following data: 1% by volume of 1068 (20% concentration) in base oil plus a suitable knock-down agent produces a spray with a 99-100% kill of flies by the Peet-Grady method; 10% by volume of 1068 (20% concentration) in base oil yields a spray with 99-100% kill of roaches by the Beltsville test method plus prolonged residual action.

By the use of VELSICOL 1068 in their formulations, insecticide manufacturers are able to improve the performance of their products . . . to offer their customers the best that science affords . . . to secure for themselves a dominant market position.

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WHAT'S NEW IN PEST CONTROL-PERSONALS

Notice

MAX ROSENTHAL, National Advertising Representative of Pests magazine, is now located at 120 Liberty St., New York City 6, N. Y., telephone COrtlandt 7-8323.

F. E. BOHMAN of The Bichard System, Inc., Hartford, Conn., spoke before the Home Extension Service of the University of Connecticut, Union, Conn., on "Disinfectants and Repellents," March 21.

VOGEL-RITT OF OHIO, INC., of Cincinnati, Ohio, has moved into new and larger quarters, 123 East Court St.

ORKIN EXTERMINATING CO., of Chattanooga, Tenn., are now conveniently located in their new and larger quarters at 1605-07 McCallie Ave.

THE U. S. INSECTICIDES CO., Seattle, Washington, has moved into its new place of busniess, 915 Western Ave.

Son Born to Melvins

Mr. and Mrs. Thomas J. Melvin announce their firstborn, Thomas Joseph, who officially joined the family as of March 7. An ex G.I. of four years Army service, Mr. Melvin is the son-in-law of Frank Rauch, owner of the Empire Exterminating Co., N. Y., with which firm he is connected. Incidentally, Mr. Melvin attended his first PCO Conference at Amherst this year and subsequently took his owner-operator test, which, from all indications, he passed. Heartiest congratulations and well wishes to the Melvins!

"ELKAY" EXPANDS—The Elkay Products Co., N. Y., suppliers of Wizo rat glue, rat glue boards, moth products, etc., has taken enlarged quarters at its present location, 323-27 West 16th Street, in order to better service the firm's greatly expanded list of accounts.

REJOIN "ELKAY"—Samuel and Sidney Piller, officials of the Elkay Products Co., N. Y., have returned to that firm after four years of honorable service in the U. S. Army.

A baby girl was born to Gertrude, wife of John K. Medoff, owner-operator of the Hudson Exterminating Co., 445 63rd St., West New York, N. J., Tuesday, April 2nd, at 12:47 P. M. at the Margaret Hague Maternity Hospital in Jersey City. The newly arrived member of the Medoff family weighed in at 7¾ pounds, and her name is to be Jean. Baby Jean will have plenty of company when she arrives home to be greeted by her sisters, Martha and Nina. Our heartiest congratulations are extended to the proud and happy parents. (P.S. We wonder if John is trying to outdo Eddie Cantor?)

VOGEL-RITT, POST CONTROL OPERATORS, CONTINUE THEIR EXPANSION PROGRAM

Vogel-Ritt, Inc., announces the opening of a branch office in Detroit, Michigan, with temporary quarters at 6432 Cass Avenue, Detroit 2. Negotiations are under way and are expected to be completed within a short time for the purchase of a suitable building. The Detroit office is under the managership of Mr. Joseph A. Watkins, residing at 16754 Fenmore Avenue, Detroit 27, Michigan, who wishes to express his gratification with the esprit de corps manifested by the various Detroit PCO's in accepting him into their fold. Mr. Watkins intends to conduct his business in accordance with the high standard set up for the industry by the National Pest Control Association.

"DDT IS 'TNT' TO THE COCKROACH," so says no less a personage than J. E. Frawley, president of the American Hotel Association and operator of Detroit's famed Fort Shelby Hotel, according to an article by A. H. Abode in the December (1945) issue of Hotel and Club News.

Mr. Frawley's observation was based on a trial test at his hotel, in which emulsions of 5% DDT and powders of 10% DDT were applied by an "army of professional pestmasters." "Beginning with man-holes in the sub-basement and continuing, over a period of time, to the very ceiling of the hotel roof they sprayed or gun-dusted every nook and corner, including the lobby, every crack and crevice possibly trespassed by enemy roach. Application of the liquid was made by use of a three-gallon electric knapsack-type sprayer equipped with a nozzle to emit a fan-shaped 200 mg. residue on walls and other flat surfaces. Application of the powder was made with a hand dust gun to places not reached by spraying.

Extreme care was used throughout the experiment to avoid DDT's contact with articles subject to human touch. Food was placed in ice-boxes and tables and other equipment thoroughly protected by heavy coverings. All rooms and areas were ventilated during and following the application.

The article notes that . . .. "four weeks later the results speak for themselves, because, generally speaking, the roaches are no more." But "in recognition of the persistent characteristics of the species, further systematic applications will be made."

MR. AND MRS. EDWIN L. MARSH celebrated their golden wedding anniversary on April 16th. A very fine leather book including many greetings from friends within the Rose Exterminator Company organization and a very fine oil painting with a beautiful gold frame were presented to Mr. and Mrs. Marsh. Congratulations!

"Hercules" Adds Eight

Eight technical sales representatives, who recently returned to Hercules Powder Company from the service or from ordnance plant employment, have completed a three-month re-training course and have been assigned by the Synthetics Department to sales offices in six districts. They will work with salesmen already there in providing more adequate service to customers.

Frank H. Crymes will join the San Francisco, Cal., office April 1, as district manager. A member of the Synthetics Department since 1939 ,he served as a captain in the Army for nearly four years before receiving his discharge last fall.

Two men have been assigned to the New York City staff. They are: William Power, former ordnance plant worker, and Judson Hurd, ex-Army sergeant and member of the department since 1936.

George Osburn and Jordan P. Snyder are added to the Chicago sales staff. Both were chemists at the Hercules Experiment Station. Mr. Snyder also worked at a Hercules-operated rocket powder plant.

Other former ordnance workers in the group are: William A. Woods, assigned to the Boston, Mass., sales office, and Charles Huhn, who will work in the Wilmington, Del., district.

Coleman Edgar, former chemist in the Testing Division, Experiment Station, will join the sales staff in Cleveland, Ohio.

The training school was started last fall to instruct salesmen in the physical and chemical properties of Synthetics Department products, and to extend their knowledge about the uses of Synthetics' products in industry. Frank G. Oswald, assistant sales director of the Synthetics Department, and J. O. Small, synthetics group leader of the Research Department, were in charge of the school.

MOUSEVILLE, A CITY FOR MICE ONLY NEW FEATURE AT BRONX ZOO

Mouseville, a miniature village built to such scale that it will be just the right size for the mice, has been opened in the

Business Opportunities

(Classified)

RATES — For individuals seeking employment, 5c per word, minimum $1.00. All others 10c per word, minimum, $2.00. All advertisements must be in the hands of the publishers seven days before publication date and must be accompanied by cash or money order for payment in full. The publishers are not responsible for any false or misleading advertisements.

Replies to advertisements where box number only is indicated should be addressed c/o PESTS, 1200 Oak St., Kansas City 6, Mo., giving box number as well.

EXTERMINATOR—Will buy contract business with good reputation. Section New York or Neighborhood. Pests, Box 5.

NO POISON — NO BAIT

WIZO
RAT GLUE BOARDS

"Once they step on they never step off."

A practical and economical way to rid buildings of rodent pests! No hazards of poisoned bait . . . or of decomposition! Easy to prepare! Just place WIZO Rat Boards near rat hole or form a runway next to walls. Fasten boards to floor to prevent pulling away. Rodents are caught firmly the moment they step on the boards.

WIZO RAT GLUE can be obtained in quantities for preparing your own boards. Write for complete particulars.

ELKAY PRODUCTS CO.
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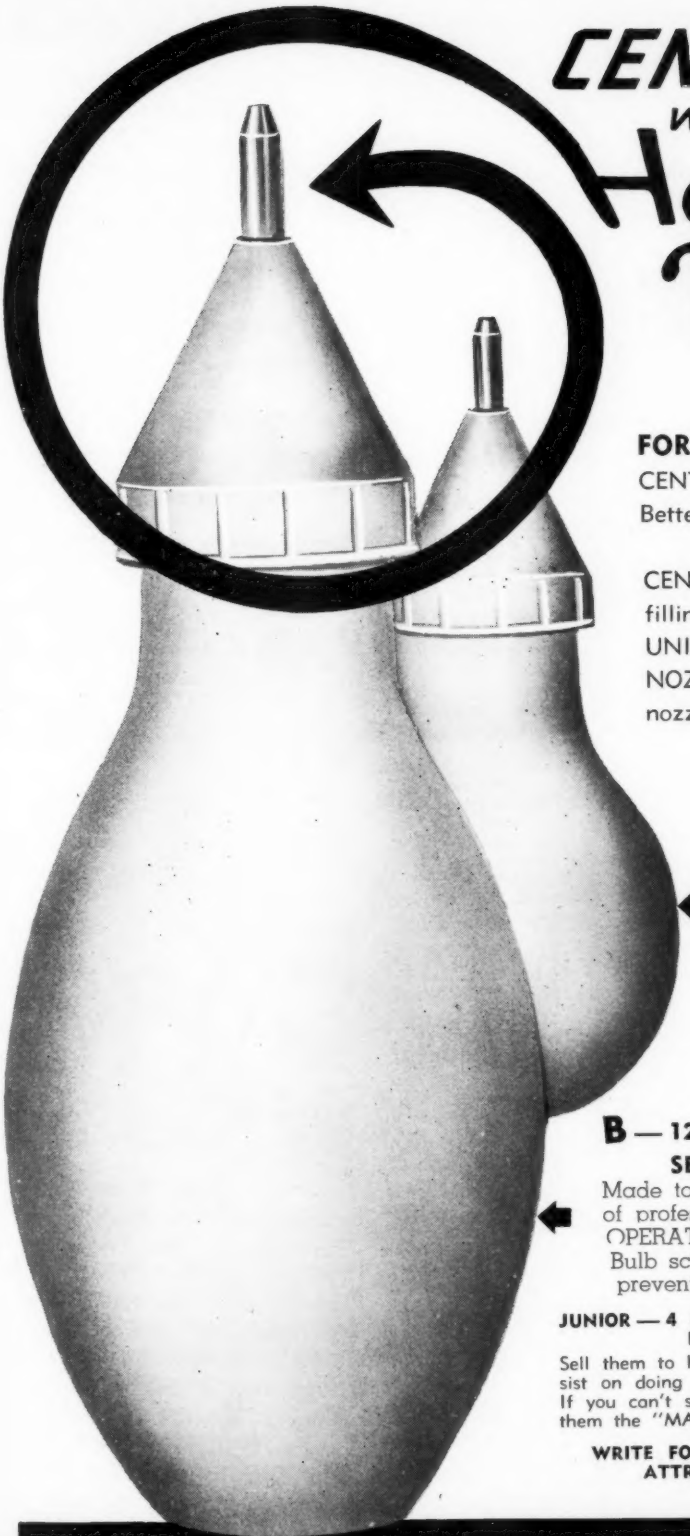
CENTROBULBS
WITH THE NEW
Heavy duty BRASS TIP Nozzle



FOR USE BY PEST CONTROL OPERATORS

CENTROBULBS give neat troubleproof service. Better than their pre-war ancestors.

CENTROBULBS have the largest opening for instant filling. Our new process insures a PERMANENT UNION BETWEEN SEAMPROOF BULBS AND NOZZLES. Easy to clean metal screens prevent nozzles from clogging.

A — 8 OUNCE CAPACITY FOR LIGHT JOBS.

Have all the features of CENTROBULBS B except that the bulb is smaller.

EXTENSION NOZZLES — SOLID BRASS

Supplied in any length desired to fit CENTROBULB B and A.

B — 12 OUNCE CAPACITY, SERVICE SIZE.

Made to meet all the requirements of professional PEST CONTROL OPERATORS.

Bulb scientifically shaped to prevent hand fatigue.

JUNIOR — 4 OUNCE CAPACITY FOR HOME USE.

Sell them to householders who still insist on doing their own exterminating. If you can't sell them "SERVICE" sell them the "MAKINGS".

WRITE FOR CIRCULAR WITH ATTRACTIVE PRICES

CENTRAL RUBBER PRODUCTS CO., Inc.
821 Broadway, New York, N.Y.

Children's Zoo in the New York Zoological Park in the Brox, N. Y., according to a recent announcement by the Zoological Society. The village will be built of metal, by which the zoo authorities hope to discourage the rowdy elements in the town from gnawing it down. The mice will be white, black and chocolate colored.

RAT POPULATION, DAMAGE—The Department of Agriculture estimates 123,000,000 rats in U. S. . . . about one-half on farms, 34,000,000 in non-farm country residences and in towns of less than 10,000; and 29,000,000 in cities over 10,000. Rats cause an estimated annual loss of $189,000,000 in all; $63,000,000 or about $10 a farm; $68,000,000 in small towns; $58,000,000 in larger cities. More than $1.50 a year a rat.

MOUSE DINES ON THE 8:24—Miss Castella Chadsey, passenger on the 8:24 A.M. train from Stamford, arrived at Grand Central Terminal, N. Y., recently, ready to testify that en route a bold mouse, which she had noticed running in the aisles, had nibbled into her lunch bag and consumed half a chipped-beef sandwich. The sandwich was placed in the seat between her and another woman passenger. Miss Chadsey lives at 16 Fowler Street, Stamford, Conn.

MOUSE CHANGES TRAINS—The mouse that nibbled the sandwich of a commuter on the 8:24 from Stamford, Conn., last week has turned up on the 5:24 to Larchmont, N. Y., bolder than ever according to Mrs. Albert Winsten, of that Westchester community. The marauder gnawed his way into a paper bag and chewed off the end of a loaf of bread which, Mrs. Winsten reported with a shudder, she was carrying in her lap.

"1080" TO BE USED IN ST. LOUIS RAT CAMPAIGN—As part of the city's campaign being planned to rid St. Louis of rats, the Monsanto Chemical Co., of the same city, has agreed to provide free, not only to a sufficient quantity of its potent rodenticide, "1080" to do an effective job but will also assign the company's technical staff to supervise its use.

Rice hulls is a waste product now being tested by Louisiana Department of Commerce and Industry for use as a flame-resistant insulant, who claim it has all properties of cork or rock wool, and is toxic to rats and mice.

BILLY BUETTNER, JR., son of the secretary, now stationed at Frankfort, Germany, has been promoted from PFC to T/5. Congratulations, Billy, in your case the expected happened.

SAFETY FUMIGANT CO. of Boston, Mass., has moved into larger location which will enable the firm to increase their line of products both in the household and agricultural fields. Their new office is 158 State St.

More power to you, Charles.

ROACH CONTROL: Eddie Bracken, motion picture actor who recently did an in-person stint at New York's Paramount Theatre, tells of the time he worked at Macy's store and was selling roach traps. "You'd lure the roach up a rope and, when the roach climbed down, he'd fall into a plate of ice cream—and catch pneumonia!"

SAFETY PLASTIC RECEPTACLE FOR 1080

A compact, inexpensive, safety plastic receptacle for use in connection with 1080 has been developed by Alan Ross of the Ross Sanitation Co., 68 Federal Street, Springfield, Mass.

Attached firmly to the receptacle is a small hole-punched stake, thus making it possible to place the receptacle in rat-and-mouse runways and other essential places and still remain out of reach of pets and human beings. Receptacle can also be used as an ant or fly cup or, for that matter, in the control of any vermin or rodents. Easily attached to any kind of a surface, such as beams, walls, studdings or can be stuck into the earth and remain immovable. Not only can food baits be placed in the receptacle but liquids as well. Because of special lip construction on receptacle, no spillage from vibration in buildings can occur. It is our understanding that receptacle will stand weight of any size rat.

Price $15.00 per gross—delivered. Free sample on request, provided you write on your firm letterhead.

The **ROSE EXTERMINATOR CO.**, of Chicago, Ill., have moved into their new and larger quarters, 1809 W. North Ave.

M.C.A. Issues Safety Data Sheet On Formaldehyde

The Manufacturing Chemists' Association has released a chemical safety data sheet on FORMALDEHYDE. This is the first of a series of product safety manuals prepared by the General Safety Committee of that Association. These safety data sheets are designed for supervisory staffs and management. They present in concise form the essential information for management in the handling and use of the chemical product.

They cover important physical and chemical properties; hazardous characteristics, including physiological and fire; usual shipping containers; unloading and emptying containers; container storage and handling; caution labels; personal protective equipment; medical controls; and first aid. Medical information is prepared by the Medical Advisory Committee of the Manufacturing Chemists' Association.

Copies of this manual are available at 15c per copy from the Manufacturing Chemists' Association, 608 Woodward Building, Washington 5, D. C.

Shades of Baron Munchausen!

Branch manager of a pest control firm operating in the South sent the following report to a company official, who, in turn, made it available for publication. Only trade name of the roach powder and firm serviced are not as in the original—Ed.

"Southern Roach Powder was supplied to this office before my arrival. I have tried to find out what this powder does that makes it worth 38c per lb. The information I received from one of the servicemen follows: 'Southern roach powder is made up in two types. One is the Left Twitch Powder and the other is the Right Twitch Powder. The serviceman can make the roach twitch either left or right by simply using that certain type twitch powder. Last week one of the servicemen made a mistake and mixed both twitch powders together. This is most unfortunate as a roach can't twitch both left and right at the same time. The result was rather sad. It happened in the Far East Chinese Gardens. The servicemen who were using double loads of both twitch powders, hit a nest of roaches. The insects didn't know whether to twitch left or right so the entire nest exploded with atomic energy, knocking the Chinese cook against a large pot of boiling soup which fell over and scalded 9 rats to death under the stove. This restaurant now insists upon having our Company use Southern products all the time. He says we kill more rats that way."

BOOKS

Please remit check with order as this will save additional expense and time.

A list of new books includes:

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Price $2.50 plus 15c postage

Chemistry of Insecticides and Fungicides
Price $4.00 plus 15c postage

Step Out and Sell
Price $1.50 plus 15c postage

Helping People Buy
Price $2.50 plus 15c postage

Strategy In Selling
Price $6.00 plus 20c postage

Outlines of Entomology by Dr. Imms
Price $3.75 plus 15c postage

Insects Injurious to the Household and Annoying to Man
Price $2.50. Postage 15c

Toxicology and Hygiene of Industrial Solvents
Price $5.00 plus 15c postage

Poisons—Their Chemical Identification and Emergency Treatments
By Vicent J. Brookes and H. N. Alyea
$3.00—Postage 15c

Insect Dietary
By Charles T. Brues
466 pp.
$5.00—Postage 15c

Insect Pests of Stored Grain and Grain Products

By RICHARD T. COTTON

Revised edition. 242 pages, 93 illustrations. This book contains a digest of available information on the insect pests of stored grain and milled cereal products and their control. The common and destructive species are described and illustrated. The handling and preservation of grain from insect attack is discussed in logical sequence from the farm until it reaches the food-processing plant.

Insect prevention and control in flour mills, warehouses, and food-processing plants is discussed in detail. Of particular interest to industrial fumigators are the 4 chapters dealing with fumigants. The common fumigants are described and their physical characteristics given. Factors affecting their efficiency are discussed and directions given for their use.

Price $3.00—Postage 15c

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It's Wizo—for a sensational complete Moth Killer Line! Kills moths, eggs, larvae—*actually prevents moths!* 100% active ingredients! Moth Killers for every purpose—in Vaporizer and Crystal form. Quick, simple, effective! Protects Clothing, Furs, Woolens, Carpets, Rugs, Upholstery, etc. Attractively packaged—sells on sight! The Big Profit Moth Line sold by leading jobbers throughout the country!

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The covering power of MM&R deodorants . . . the refreshing fragrance of MM&R perfume oils . . . remain CONSTANT in your product to the very end. Scientifically-perfected and performance-proven, MM&R neutralizing and perfuming materials meet every requirement of discriminating users. Yet they are priced typically MM&R-low. For further information, write to the MM&R Technical Dept.

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MICE-KIL-R NON-POISONOUS

MICE BAIT

NOTHING EVER LIKE IT BEFORE!
KILLS MICE ONLY . . . NOT FOR RATS!
READY TO SELL AND USE • DRY FOOD FORM

A Revolutionary Development that WILL AMAZE EXTERMINATORS EVERYWHERE! A NON-POISONOUS BLEND that entices MICE TO THEIR DOOM where other baits have so miserably failed!

ADD MICE-KIL-R to YOUR LINE! Sell or Use It UNDER YOUR OWN NAME—as you like. But—be the first to CASH IN BIG on the tremendous fields of untouched PROFITS this Sensational Discovery (Never-before-thought-possible) NOW BRINGS!

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RAT-KIL-R

THE BIG RAT BAIT MONEY MAKER!

USED AND SOLD BY EXTERMINATORS THROUGHOUT U. S. A.

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- FLY-KIL CONCENTRATE
- ROACH-KIL CONCENTRATE
- INDUSTRIAL DISINFECTANT
- TERMITE-KIL CONCENTRATE
- INSEC-GAS FUMIGANT
- SAF-UZE ROACH POWDER

LOCAL ORGANIZATION NEWS

Indiana State Pest Control Operators Association

A meeting of the Indiana State Pest Control Operators Association was held at the Indianapolis Athletic Club, Indianapolis, Indiana, on March 23rd, 1946. State legislation was discussed, but no action taken. The next meeting will be held in Hammond, Indiana, on June 22nd.

Northern California Pest Control Association, Inc.

A quarterly meeting of the NCPCA was held on April 27 at the Hotel Senator, Sacramento, Calif. Lasting all day the meeting was devoted to talks of business and technical interest which included:

"Building Materials For Termite Operators" by C. D. LeMaster, Editor and Publisher of Western Bldg. Rev.

"Wartime Aviation Quarantine" by W. M. Herms, Lt. Comdr., USNR (son of Prof. W. B. Herms).

"Labeling and Packaging of Economic Poisons" by Allen B. Lemmon, Chief, Bureau of Chem., Dept. Agr. Cal.

"The Practice of Parisitology in War-Torn Europe" by Jack Kitley, formerly with Sanitation Corps, U.S. Army.

"Problems Regarding Pest Control Licenses" by Percy C. Heckendorf, Director, Fred A. Taylor, Asst. Director, J. F. Graham, Registrar, Structural Pest Control Board.

President V. H. Montgomery presided.

Highlight of the banquet during the evening was a talk on "Pests and Pest Control in Mid-Pacific" by Stanley F. Bailey, Asst. Prof. of Entomology, University of California.

Eastern Pennsylvania Pest Control Association

On March 12th the first quarterly meeting for the year 1946 was held, as usual, at the Hotel Lorraine, Philadelphia. The attendance was excellent and, after a fine dinner, the group enjoyed a most delightful presentation of vocal selections, both humorous and serious, by Mrs. Barrett Jones, who incidentally is the charming and talented sister of Secretary Russell H. Bauer. Mrs. Jones was accompanied at the piano most cabably by Mrs. Virginia Duffin. The Association is deeply indebted to "Russ" Bauer for this splendid contribution to the success of the meeting.

During the business meeting, President "Bud" Sharpe reported that contact has been established with Penn State College with reference to a short course in entomology and all members pledged their support in inaugurating such courses at this college in the near future. Mr. Sharpe also gave a really surprising demonstration of memory training, which was followed by another presentation of songs and music by Mesdames Jones and Duffin, both of which entertainments were well received and greatly enjoyed by everyone present.

Messers. Martin T. Meyer and John G. Vogel addressed the meeting on the subjects of Cost Accounting and Job Pricing, the members taking part in an open forum on these subjects, which proved very helpful and instructive to all.

The next meeting is scheduled for June 11th.

The following persons were present:
John T. Kavanaugh, Vogel-Ritt, Inc.
C. D. Cushing, Vogel-Ritt, Inc.
L. E. Sellman, Sr., Vogel-Ritt, Inc.
John G. Vogel, Vogel-Ritt, Inc.
H. B. Holmes, Western Ext. Co.
Joseph B. Muth, Western Ext. Co.
Arthur Hammel, J. C. Ehrlich Co.
Tom Harkin, J. C. Ehrlich Co.
Pete Salino, J. C. Ehrlich Co.
Frank O'Neill, McWilliams Pest Control.
Walter McWillams, McWilliams Pest Control.
H. Boohar, Boohar Chemical Co.
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H. A. Kruse, Abalene Ext. Co.
W. Cholerton, ABC Ext. Co.
Carl L. McClure, McClure-Camden.
Martin T. Meyer, Theo. Meyer Estate.
Arthur Richards, A. H. Richards & Sons.
S. J. Herman, U. S. Fumigating Co.
W. C. Sharp, Smithereen Co.
Mrs. E. Sharp.
Joseph R. Hynak, Shur-Way Ext. Co.
Mrs. Hynak.
D. L. McCullough, Sanitary Ext. Co.
Mrs. Helen McCullough.
R. H. Bauer, Bauer Ext. Co.
Mrs. Barrett B. Jones.
Mrs. Virginia Duffin.

Submitted JOHN G. VOGEL, Chairman, Public Relations Committee.

Northern California Pest Control Association Annual Meeting

The first regular meeting of the Northern California Pest Control Association since the organization meeting was held in Hotel Shattick, Berkeley, on January 12. Members were present from as far south as Fresno and others from Nevada attended.

V. H. Montgomery demonstrated an improved sprayer for DDT which has been perfected for operator's use. Ted Sibert of Paramount exhibited a portable type of machine which produces a very fine spray by means of gas pressure somewhat as is done by the aerosol bomb. Both machines are light enough to be carried by one man.

Wayne K. Davis spoke on costs in connection with termite control. Figures which were supplied him by a number of different operators showed a fairly close agreement in the proportion of costs chargeable under the more important headings. Considerable valuable discussion arose on this important topic.

E. G. Millis led in a discussion of costs in relation to rodent control. Amplifying his remarks to include costs in other types of work he said that to be profitable to his employer a service employee should do from $30.00 to $40.00 worth of work per day.

Charles Menard of the Rose Exterminator Company spoke of the present status of labor organizations in the pest control industry.

A helpful kind in termite control was given out by C. P. Cain of Fresno. Precast concrete post blocks as usually shaped are very hard to handle under a house. By casting them in a cylindrical shape they can be easily rolled into position. Forms for casting are made in two separable parts and can be used over and over again.

A motion presented by E. O. Corson proposed a committee to consider the establishment of a course in pest control at the University of Califronia. The motion was passed with no dissenting votes.

The officers who have been serving temporarily during organization proceedings were reelected.

The next meeting will be held at Sacramento in April.

It was announced that it has not been possible to arrange for a Pacific Coast Conference in February and that it is not likely that one will be held this year.

N. J. Pest Control Association Minutes For Meeting of April 17, 1946

A testimonial dinner honoring four members namely, John Medoff, Fred Bowers, J. Edwin Sameth, and David P. McAlindin, was held at Zig's Restaurant in Newark prior to the regular meeting of the N. J. Pest Control Ass'n. It was through their diligence and sincere efforts that the Short Course on rodent and termite control at Rutgers College was acclaimed as a huge success. The membership in token of their appreciation invited these four men and their wives or female guests to this dinner.

After the festivities a regular meeting was conducted by President McAlindin. The treasurer reported a bank balance of $257.37. Committee reports were as follows:

Membership—An application was received from Mr. Max Harwin of the Allen Exterminating and Termite Control Company of Newark, New Jersey. His application was approved by the membership committee and further action was tabled under new business.

Hospitalization—Chairman Kutakoff had no further report to make and this matter was tabled for further consideration at a future meeting.

Squirrels—Chairman John Medoff advised the members that he had received a communication from the Game Warden which indicated that squirrels could not be exterminated without permission from this bureau.

Educational Committee—J. E. Sameth reporting on the Short Course at Rutgers read various letters received from individuals, who showed their approval of the manner in which our association presented this course. Only fifty registrations were accepted although many more were received. About $250 will be donated to the Hedley Fund. From a financial standpoint it was found that the association would not have to cover any expenses of the Short Course. As a matter of fact there remained some surplus materials which were offered for sale to the members for a nominal amount. These supplies are in the hands of President D. P. McAlindin.

Canadian Conference—Fred Bowers, the only member who attended this conference, touched on some of the highlights of this function.

Old Business—President McAlindin announced that the Jumbo Meeting would be held on May 15, but the meeting site had not yet been settled. He gave a brief outline on the proposed activities of this evening and promised definite information would be sent to the members in the near future.

New Business—The application for membership received from Max Harwin was presented by the membership committee, and

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this new member was unanimously elected to the association.

Good and Welfare—The members had a chance to voice their opinions regarding future Short Courses.

Those present at the meeting were: J. E. Sameth, John Medoff, David McAlindin, Fred Bowers, Walter Boyce, Murray Breecher, Harry Stucker, Robert Campbell, Harold Kutakoff, Harold Kruse, Joseph Geisman, and Abe. Charnack. Guests present were: Mrs. Sameth, Miss Roberts, Mrs. Boyce, Mrs. Breecher, Mrs. Kutakoff, Mrs. Charnack, Mrs. Geisman, and r. Laudani.

Submitted by Abe I. Charnack, Secy.

Ohio Pest Control Association

Meeting of Ohio Pest Control Operators was held in the Deshler-Wallick Hotel in Columbus on March 16, 1946, at 10:00 A. M., and it unanimously agreed that an association to be known as Ohio Pest Control Operators Association was to be duly incorporated under the laws of the State of Ohio. Meeting was attended by following:

Mr. Art Davis, ABC Exterminating Co., Dayton.

Mr. Wm. Shreeves, ABC Exterminating Co., Sidney.

Mr. L. A. McKenna, AC Exterminating & Chem. Co., Cleveland.

Mr. Harry Ross, Acme Exterminating Co., Zanesville.

Mr. Richard Meyer, American Exterminators, Inc., Cincinnati.

Mr. E. Purcell, Arab Pest Control Co., Springfield.

Mr. J. Mooney, Arab Insect & Rodent Con. Co., Columbus.

Mr. Richard K. Barnett, Barnett Pest Control, Dayton.

Mr. Hugo Burgel, Capital City Exterminating Co., Columbus.

Mr. H. Van Fleet, Columbus Forest Rose Ter. Con., Columbus.

Mr. Wm. H. McKain, Extermital Chemicals, Inc., Dayton.

Mr. B. G. Scherzinger, Extermital Termite Con. Co., Cincinnati.

Mr. J. L. Purdy, Extermital Termite Service, Hamilton.

Mr. C. O. Benson, Forest Rose Termite Con. Co., Lancaster.

Mr. L. R. Amrine, Extermital Termite Control, Marion.

Mr. Harry E. Studier, Guarantee Exterminating Co., Cleveland.

Mr. Herman Militzer, H & M Laboratories, Toledo.

Mr. Waldo R. Augsperger, Huemite & Co., Dayton.

Mr. John H. Gedeon, Knox Fumigating Co., Cleveland.

Mrs. Harriett Mast, Master Pest Control Co., Akron.

Mr. H. S. McGahan, McGahan Tri-State Exterminators, Portsmouth.

Mr. S. H. Justice, Noxx Chemicals, Columbus.

Mr. Herman A. Beck, Ohio Exterminating Co., Columbus.

Mr. Henry Schmitt, Ohio Termite Control, Columbus.

Mr. R. M. Pursell, Ohio-Penna Exterminator Co., Youngstown.

Mr. Luther T. Pitts, Orkin Exterminating Co., Cincinnati.

Mr. A. M. Akers, Rose Exterminating Co., Cleveland.

Mr. Robert Yeager, Rose Exterminating Co., Cincinnati.

Mr. C. A. Selway, State Termite Co., Canton.

Mr. W. M. Faulkner, T & F Exterminating Co., Zanesville.

Dr. H. K. Steckel, The Tornado Mfg. Co., Columbus.

Mr. Wm. R. Warthen, Vogel-Ritt of Ohio, Inc., Cincinnati.

Mr. R. J. Andes, Vogel-Ritt of Ohio, Inc., Columbus.

Mr. Wm. Phippard, Wilmar Co., Inc., Cincinnati.

Mr. Wm. O. Buettner, Natl. Pest Control Assn., Brooklyn, N. Y.

Mr. Kelly Laughead, H. D. Hudson Mfg. Co., Columbus.

Mr. C. E. Quirk, Ohio Products Co., North Madison.

Wm. O. Buettner, Secretary of the National Pest Control Association was present and the group unanimously elected him as temporary chairman of the meeting.

The following officers were elected: President, H. K. Steckel, Columbus; Vice-President, W. R. Phippard, Cincinnati; Secretary-Treasurer, B. A. Laing, Cleveland. Directors: H. Studier, Cleveland; H. Militzer, Toledo; W. Faulkner, Zanesville; R. Barnett, Dayton, and R. Yeager, Cincinnati.

Dr. T. H. Parks, Extension Entomologist of Ohio State University addressed a group after luncheon. The following telegram was received from Ted Oser, President of the National Pest Control Association: "Please convey my best wishes to the Pest Control Operators of Ohio for a successful and lasting association." After completion of business and discussion of items of current interest, President-elect H. K. Steckel addressed the group, pledging full effort and asking complete cooperation.

The meeting was adjourned at 4:15 P. M., after a short closing address by S. H. Justice, Columbus representative of the organizing committee.

Ontario Pest Control Association

The Ontario Pest Control Association held its first annual meeting and banquet March 27, 1946, at the Royal York Hotel, Toronto.

Officers and directors elected were:

E. J. Gentle, President, Hamilton, Ont.; H. R. Corbett, Vice-President, St. Thomas, Ont.! V. F. Prentice, Secretary, Toronto, Ont.; Wm. Myers, Treasurer, Toronto, Ont.; Melvin Dunn, Director, Ottawa, Ont.; F. C. Gilding, Director, Toronto, Ont.; Wm. Ellis, Director, Toronto, Ont.; R. F. Hamlin, Toronto, Ont.

Future policies of the Association were discussed. The meeting adjourned at 6 p.m., following which the banquet was held.

Entertainment provided by the Program Committee was thoroughly enjoyed by all. It comprised magic and mind reading by a past master of the art.

Following the regal repast, guest speaker of the evening, Dr. C. R. Twinn, Entomologist, Dominion of Canada, Dept. of Agriculture, Ottawa, highlighted the proceedings with a instructive talk on the history of Pest Control and Chemicals, past and present.

The Pest Control Industry in Relation to Public Health was the topic discussed by the next speaker, Dr. Gordon P. Jackson, Medical Officer of Health, Toronto, who congratulated the Association on the excellent progress it had made. Other speakers included Prof. R. W. Thompson, Dr. L. A. Clarke, Dr. J. E. Laxton and Dr. Carl E. Hookins, all of whom assured the gathering of their desire to cooperate with the industry at all times.

W. S. Bomby ("Bill" to you), who acted as host and master of ceremonies, did a swell job in his inimitable way.

Meeting roster follows:

E. F. Abell, Waverley Pest Control Co., Toronto.

C. L. Bannister, Acme Exterminating Co., Toronto.

W. S. Bomby, Ocean Chemicals, Ltd., Toronto.

W. E. Bomby, Ocean Chemicals, Ltd., Toronto.

H. R. Corbett, C & C Products and Service, St. Thomas.

H. N. Dickenson, Derpo, Ltd., Toronto.

M. B. Dunn, Ottawa Pest Control Service, Ottawa.

Wm. Ellis, Kills-All Products, Toronto.

F. C. Gilding, Canadian Distributors, Ltd., Toronto.

E. J. Gentle, Pest Control Service, Hamilton.

R. F. Hamlin, Fairview Chemical Co., Toronto.

W. C. Harris, Safe-way Exterminating Co., Toronto.

J. J. Jeans, Ocean Chemicals, Ltd., Toronto.

R. E. Jones, Dominion Exterminating Co., Toronto.

C. M. McCarthy, Bikoe Manufacturing, Co., Ltd., Toronto.

R. W. Menzie, Derpo, Ltd., Toronto.

W. Myers, Atlas Fumigators, Toronto.

J. Miller, Ocean Chemicals, Ltd., Toronto.

Jas. Niven, Ocean Chemicals, Ltd., Toronto.

A. C. Naylor, Central Fumigators, Toronto.

V. F. Prentice, Bikoe Manufacturing Co., Ltd., Toronto.

F. H. Richardson, Toronto.

C. E. Ryder, Pest Control Clinic, Hamilton.

R. Gorrie, Harrison & Crossfield (Canada) Ltd., Toronto.

K. N. Marriott, Shell Oil Co., of Canada Ltd., Toronto.

R. W. Hutton, Shell Oil Co., of Canada Ltd., Toronto.

H. W. Price, P. N. Soden & Co., Ltd., Toronto.

V. L. Bartram, Monsanto (Canada) Ltd., Toronto.

H. S. Smith, Charles Albert Smith Ltd., Toronto.

T. J. Brioux, Charles Albert Smith Ltd., Toronto.

Dr. C. R. Twinn, Entomologist, Dom. of Canada Dept. of Agriculture, Ottawa.

Prof. R. W. Thompson, Provincial Entomologist, Ontario Agricultural College, Guelph.

Dr. Gordon P. Jackson, Medical Officer of Health, Toronto.

Dr. L. A. Clarke, Asst. Medical Officer of Health, Hamilton.

Dr. J. E. Laxton, Dept. of Public Health, Toronto.

Dr. Carl E. Hookings, Medical Officer of Health, Central District, Bermuda.

David K. Lee, Dept. of Public Health, Toronto.

H. E. Rothwell, Health Dept., Province of Ontario. —Submitted by E. J. Gentile.

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II. Plants as Housepests. Bacteria. Molds which live in the house. Timber rot, fungus. What plants do to housepests and what housepests do to plants and plant products. Pages: 62.

III. Lower Animals. Protozoa, worms, snails, millepedes, spiders, mites, many others, as far as they are housepests. Pages: 112.

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What it is; what it does; how to use it. Described are dosage schedule for various type pests, methods of application and preliminary precautionary measures.

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A bulletin on the intimate blending of fine chemical, food and insecticide powders. Copies of this 8-page bulletin in two colors may be obtained from SPROUT WALDRON CO., Muncy, Pa.

For the following publications write GEIGY COMPANY, Inc., 89-91 Barclay St., New York City, N. Y.

MECHANISM OF INTOXICATION OF DDT INSECTICIDES IN INSECTS AND WARM-BLOODED ANIMALS

Booklet contains a copy of the material presented by Dr. Paul Lauger, Director of Research, J. R. Geigy, S.A., Basle, Switzerland, at a Joint Meeting of the Army Committee for Insect and Rodent Control and the O.S.R.D. Insect Control Committee. It is a technical discussion concerning the action of DDT insecticides on insects and hence concerns fundamental aspects of pest control. Available on request, this article is of value to those working in the field of chemistry as related to insect control.

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An interesting and instructive three-color wall chart concerning compatibility of Geigy DDT insecticides (dusts and wettable powders) with various materials which are commonly used in pest control schedules is available on request.

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WHAT TO DO ABOUT TERMITES AND LYCTUS BEETLES

Illustrated in color, circular presents some interesting facts about termites and lyctus beetles and their control with Permatox A (Pentachlorphenol), 1-10 concentrate.

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WRITE SPRAYING SYSTEMS COMPANY, Dept. P., 4093 West Lake St., Chicago 24, Ill. Ask for Catalog No. 22.

FORTIFIED RED SQUILL

Circular, which includes bait chart, describes a Fortified Red Squill powder activated and standardized.

WRITE R. J. PRENTISS & CO., 110 William St., New York City 7, N. Y.

HILL TERMITE CONTROL SYSTEMS

For complete particulars, write Hill Termite Control Systems, 20 South Third Street, Memphis 3, Tenn.

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Circular describes a vivid action film of greatest value to every PCO and opportunities it affords PCO to build good will and better public relations.

WRITE WIL-KIL PEST CONTROL, 522 W. North

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An attractive booklet on Penco Grain Fumigant; is an economical, effective, easily applied fumigant for control of insects attacking stored grain.

WRITE PENN SALT MFG. CO., 1000 Widener Bldg., Philadelphia, Pa.

FOR THE FOLLOWING PUBLICATIONS WRITE MINE SAFETY APPLIANCES CO., Braddock, Thomans & Meade Sts., Pittsburgh 8, Pa.

RESPIRATOR

Bulletin discusses "Clear-Vue" model Dustfoe Respirator, which it is stated is durable, odorless, noncorrosive and a non-conductor of electricity and heat and gives a proved protection against toxic dusts.

HYDROCYANIC GAS MASK

Bulletin describes Hydrocyanic gas mask with all-vision facepiece.

ALL-PLASTIC GOGGLE

Circular describes a new lightweight, all-plastic goggle which provides comfortable, durable protection for the eyes.

NEW PERFUMING PRINCIPLE FOR INSECT SPRAY TOXIC AGENTS

Fragrance of sprays, up to now one of the unmentionables of insect toxicants, now becomes an asset instead of a liability. Samples may be had by writ-MAGNUS, MABEE & REYNARD, 16 Desblosses St., New York City.

NEW TOXICANT

Reprint of paper on "Velsicol 1068 (20% concentrate)," formerly known as "Vel-Tox," which appeared in Journal of Economic Entomology.

Write VELSICOL CORP., Dept. P., 120 E. Pearson Street, Chicago 11, Ill.

TREATMENT FOR BURNS

Circular outlines following qualities of Hydrosulphosol Ointment for industrial first aid burn treatments:

WRITE DAVIS EMERGENCY EQUIPMENT CO., 45 Halleck St., Newark 4, N. J.

DDT BOOKLET

A new eight-page color booklet has been prepared by the Pennsylvania Salt Manufacturing Company to describe its five Penco DDT products for the agricultural and insecticide industries and give some basic facts about DDT itself.

The booklet explains exactly what DDT is, how it can best be used, what limitations it has and where it excels in insect control.

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WRITE PENNSYLVANIA SALT MANUFACTURING COMPANY, Dept. P., 1000 Widener Building, Philadelphia 7, Pa.

MSA DEMAND-TYPE OXYGEN MASK

Mine Safety Appliances Co., Braddock, Thomas and Meade Sts, Pittsburgh 8, Pa., announces a demand-type oxygen mask for respiratory protection in unbreathable atmospheres. It is always ready for use and requires no special training or practice for operation: the wearer needs only to put on the mask, open a valve and breathe. One of the two types has an oxygen cylinder on the wearer's back supported by an adjustable harness, with oxygen supplied for an hour of normal breathing. The front sling type has a smaller cylinder for shorter periods. Both provide oxygen exactly as needed by the individual wearer by means of the demand regulator. The mask is equipped with a pressure gage which indicates the amount of oxygen in the cylinder at all times. The breathing tube is quickly disconnectable for conservation of oxygen during stand-by periods. Fogging of the mask's all-vision facepiece is prevented by a flow of cool oxygen over the lenses.

MINE SAFETY APPLIANCES CO., Braddock, Thomas and Meade Streets, Pittsburgh 8, Pa.

The NPCA Fumigation Committee is not ready to recommend the use of oxygen type of equipment on commercial fumigation work. It very definitely has a place in rescue or emergency work. The Committee continues to recommend the use of the canister type mask—Ed.

FOR THE FOLLOWING PUBLICATIONS WRITE AMERICAN CYNAMID & CHEMICAL CO., 30 Rockefeller Plaza, N. Y. 20, N. Y.

GAS MASKS

Some constructive suggestions on the care and maintenance of gas masks are contained in this News Bulletin.

NEW SPOT FUMIGANT

Leaflet describes Acrylon, a new spot or local fumigant. Very effective, it is stated, for use in treating the machinery in flour mills, bakeries and many other places, particularly for the control of Mediterranean flour moth, confused flour beetle, flat grain beetle, cadelle, and similar insects. Not a contact spray, Acrylan, it is further stated, has no deleterious effect on baking qualities of flour and leaves no residual odor.

FIRE IN A BUILDING UNDER FUMIGATION—PROCEDURE

Is the title of an informative bulletin on the subject. Also included are answers to some fumigation questions of interest to every PCO.

FUMIGATION SAFETY RULE

BULLETIN 80.

EFFECT OF HYDROCYANIC ACID ON FOODSTUFFS

REMOVAL OF PHOTOGRAPHIC FILMS AND PAPERS BEFORE FUMIGATION

BULLETIN 88.

EDUCATE THE DOCTOR IN FUMIGATION FIRST AID PROCEDURE

ELECTRIC FANS HAVE SEVERAL USEFUL FUNCTIONS IN FUMIGATION WORK

BULLETIN 84.

DDT FORMULATIONS BULLETIN DISCUSSES

BULLETIN 94.

FUMIGATOR'S FIRST AID KIT

BULLETIN 93.

DEVELOPMENT OF HCN FUMIGATION

BULLETIN 96.

METHYL ORANGE TEST PAPERS

BULLETIN 95.

MECHANICAL MEANS FOR QUICK VENTILATION OF FUMIGATED SPACES

BULLETIN 97.

Case History*

RODENT CONTROL IN GROCERY WAREHOUSE

Dow Methyl Bromide disposes of rodents in a few hours

*Actual Record on file at The Dow Chemical Company

Ordinary fumigants had failed to control rats in a wholesale grocery warehouse.

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The plan of operation was simple: *Sealing procedure*—windows and doors sealed with masking tape, ventilators and other large outlets with oiled 40 pound Kraft paper. *Materials removed*—iodized salt because of the chemical reaction between its stabilizing agent and the fumigant. *Dosage and exposure period*—¼ pound per 1,000 cubic feet of space for an overnight period. *Method of application*—in basement, iced cans of Dow Methyl Bromide poured into shallow pans so that the gas would completely blanket the floor and sink into the burrows; on the first floor, 10 pound cylinders with enough fans running for 30 minutes to thoroughly mix the gas with the air. *Aeration period*—2 hours with fans operating (normal operation next morning).

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